TMDL Project Report for PCBs in San Francisco Bay
Comment Letters Received
(listed in alphabetical order by organization)

Alameda Countywide Clean Water Program

Bay Area Clean Water Agencies

Bay Area Stormwater Management Agencies Association

Bay Planning Coalition

Blasland, Bouck & Lee, Inc.

California Chamber of Commerce (prepared by Latham & Watkins LLP)

City of Palo Alto

City of San Jose

City of Sunnyvale

Clean Water Fund

Department of the Navy

East Bay Municipal Utility District

Latham & Watkins LLP

Marin Audubon Society

Pacific EcoRisk

Partnership for Sound Science in Environmental Policy

Port of Oakland

Port of San Francisco

San Francisco BayKeeper/ Waterkeepers

San Francisco Estuary Institute

San Francisco Public Utilities Commission

U.S. Army Corps of Engineers

U.S. Environmental Protection Agency

Western States Petroleum Association

Alameda Countywide
Clean Water Program

A Consortium of Local Agencies

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February 19, 2004

Fred Hetzel
California Regional Water Quality Control Board,
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Fred:

SUBJECT: TMDL PROJECT REPORT FOR PCBs IN SAN FRANCISCO BAY

This letter is submitted on behalf of the Alameda Countywide Clean Water Program (ACCWP) in response to the invitation to submit comments on the Regional Board staff report dated January 8, 2004 entitled *PCBs in San Francisco Bay Total Maximum Daily Load Project Report* (hereinafter referred to as the Project Report).

We commend the Regional Board staff on the hard work put into preparing the Project Report and appreciate the opportunity to provide comment. As you know, the ACCWP member agencies are committed to reduction of the discharge of pollutants contained in urban runoff to the maximum extent practicable in order for all to enjoy the beneficial uses of the state's waterbodies.

The ACCWP supports and concurs with the comments filed on the Project Report by BASMAA. In addition to the issues raised in their comments, we would like to add a few specific comments.

1) The Project Report proposes that individual wasteload allocations will be developed for each municipality or countywide program which will implicitly include Caltrans and industrial stormwater discharges located in the program area. This is not appropriate. Caltrans and General Industrial Permit facilities are covered under separate stormwater discharge permits and should be given a separate wasteload allocation. This is particularly important in the case of Caltrans since local governments do not have the authority to regulate a state agency. The General Industrial Permit facilities also should be assigned a wasteload allocation because many of these facilities are the most likely sources of PCBs in the urban environment. In particular, PG&E, General Electric, and the industrial facilities cited in the project report as currently using PCBs should be given waste load allocations.

2) The proposed urban runoff wasteload allocation is unrealistic and cannot be achieved through the implementation of controls to reduce the discharge of PCBs to the "maximum extent practicable," the standard imposed by the Clean Water Act. According to the Project Report, meeting the allocation would require a 94% reduction in annual loads. The only significant PCB "hot-spot" identified thus far in the county of Alameda is the Ettie Street watershed in Oakland. ACCWP has estimated that the discharge from the Ettie Street watershed may account for about 10% of the discharge from the county. Even assuming that all of the sources within the Ettie Street watershed could be identified and eliminated (it is far from clear that that is possible), the proposed wasteload allocation would require an additional 84% reduction in annual PCB loads. Most of the other PCBs are distributed over a very wide area and could not be reduced sufficiently to meet the wasteload allocation without extravagant and infeasible large-scale stormwater treatment systems. Consequently, the ACCWP seriously questions the ambitious load reductions for urban runoff set forth in the Project Report.

Thank you for your consideration of these comments. We look forward to our continued work with the Regional Board on the reduction of PCB discharges to waters of the San Francisco Bay.

Sincerely,

James Scanlin

James Scanlin, Program Manager

Copy (via email): Bruce Wolfe
Thomas Mumley
Dale Bowyer
ACCWP Management Committee Representatives

Bay Area Clean Water Agencies

Leading the Way to Protect Our Bay

A Joint Powers Public Agency

P.O. Box 24055, MS 702

Oakland, California 94623

February 20, 2004

Mr. Fred Hetzel
San Francisco Regional Water
Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612

BACWA Comments on PCBs in San Francisco Bay, Total Maximum Daily Load (TMDL) Project Report

Dear Mr. Hetzel:

On behalf of the Bay Area Clean Water Agencies (BACWA), I want to thank you for the opportunity to comment on the proposed TMDL project report for PCBs in San Francisco Bay. The membership of BACWA is comprised of local governmental agencies that are leaders in urban water resource management and public stewardship of the Bay water quality. BACWA members own and operate publicly-owned treatment works (POTWs) that discharge to water of the San Francisco Bay Estuary. Together, BACWA's members serve over 5 million people in the nine-county Bay Area, treating all domestic, commercial, and a significant amount of industrial wastewater. BACWA was formed to develop a region-wide understanding of the watershed protection and enhancement needs through reliance on sound technical, scientific, environmental and economic information and ensure that this understanding leads to long-term stewardship of the San Francisco Bay Estuary.

BACWA and its member agencies have an interest in all TMDLs prepared for the San Francisco Bay, and the PCBs TMDL in particular. Overall, BACWA would like to commend the San Francisco Regional Water Quality Control Board (Regional Board) and its staff for putting together an excellent first draft for the PCBs TMDL. PCBs are not easy pollutants to address and the Regional Board has made valiant efforts to recognize the complexity of the situation and address such complexities appropriately.

While recognizing the challenge with preparing the PCBs TMDL, BACWA submits the following comments on the PCBs TMDL Project Report dated January 8, 2004.

Wasteload Allocations

As drafted by the Regional Board, the PCBs TMDL recognizes that NPDES-permitted facilities discharge a small fraction of the total PCBs load to the Bay, and in general operate at a high level of performance. While the TMDL recognizes the minor input from wastewater discharges, it limits the wasteload allocations to no more than the current combined annual loads of 2.3 kg/yr

for municipal wastewater discharges. The 2.3 kg/yr wasteload does not account for future growth that is expected to occur throughout the Bay Area.

Instead of limiting the wasteload allocation to the current load, BACWA supports the development of a wasteload allocation that allows for minor increments of PCBs to account for increased flows. The San Francisco Bay Mercury TMDL allows for such changes in the mercury wasteload allocations and should be used as a model.

BACWA has significant concerns about the following specific requirements that are proposed to be incorporated into the NPDES permits for wastewater dischargers:

Develop and implement effective PCB source control program to minimize significant PCB intake. Our comments and concerns are that first there is no assurance that any source control program would be effective and that second that there appears to be the assumption that our current intake is significant. If the source control programs are not effective, POTWs will be at risk of permit violations, which is not an acceptable position. Accordingly, BACWA recommends the following: *"Investigate and if found feasible and effective develop and implement a PCB source control program to reduce PCB intake."*

Provide support for studies aimed at better understanding the bioavailability of PCBs for different sources, and the long-term fate of PCBs in the Bay. While BACWA could support the studies, our concerns rest with this statement on page 65 in the Wastewater Discharges section: "The potential bioavailability of PCBs in wastewater may not be significant, but this needs to be verified." If such a statement is not made of all sources, the statement can be turned to make it look like there is a unique issue with wastewater PCBs, which there is not data to support. We request the supporting sentence for this requirement be modified to be neutral and apply to all sources to support the food web model.

Targets

BACWA supports the Regional Board's decision to focus the PCBs TMDL on a fish tissue target. We agree that the California Toxics Rule numeric criterion for water column concentration is not an appropriate basis for the target for the PCBs TMDL. It would be inappropriate to use the CTR numeric criterion, as there is no established relationship between PCBs levels in fish tissue and PCBs in water.

The State Water Resources Control Board's (SWRCB) current process for developing sediment quality objectives, and the SF Bay PCBs food web model, currently in preparation Both may have a significant affect on the ultimate sediment target. The development of a sediment target or objective for PCBs is a very time-intensive and complex undertaking, which is why the SWRCB has embarked on a multi-year process and schedule. The sediment target as calculated in the project report is based on many assumptions. To provide more scientific certainty, the Regional Board should characterize the sediment target as interim until the SWRCB has completed its process for the development of a sediment quality objective. Similarly, the ongoing development of the food web model holds promise for providing a clearer

understanding of the linkage between sediment and fish tissue concentrations, as well as impacts on human and ecological receptors.

Linkage Analysis

BACWA supports the use of models to predict the long-term fate of PCBs in the Bay and to determine the TMDLs necessary to protect and attain beneficial uses. However, BACWA is concerned that the simplicity of the mass budget model is not appropriate as the basis for the development of the TMDL for PCBs in the highly diverse San Francisco Bay. BACWA recommends the Regional Board consider modifying the TMDL report once the more sophisticated model being prepared by the United States Geological Survey and the Regional Monitoring Program is complete.

Other concerns

The RWQCB cites water reuse may be used to avoid adverse impacts. BACWA has both studied and supported water reuse, and has found that it is a local issue that has many institutional constraints. The report should acknowledge the complexities of reuse implementation as well as the advantages. Page 42, at the end of the first paragraph there is a statement to the effect that Central Valley PCBs and sediment may lower impairment by burying the contaminated in-bay sediment. Sediment movement is a complex issue; BACWA understood from the mercury TMDL that the Bay was losing sediment and that the short-term impairment might be greater until some of the top sediment was moved into the ocean. Our key point is that sediment movement is a key unknown that limits our ability to estimate recovery time from the impairment and in fact how the recovery will occur. We believe this uncertainty should be reflected in the text.

In closing, BACWA appreciates the opportunity to comment on the PCBs TMDL Project Report and looks forward to working with the Regional Board to further improve the report and its application to the San Francisco Bay.

Sincerely,

J. Kelly

James M. Kelly, Chair
Executive Board

e-copy: Members

Alameda Countywide
Clean Water Program

Contra Costa
Clean Water Program

Fairfield-Suisun
Urban Runoff
Management Program

Marin County
Stormwater Pollution
Prevention Program

San Mateo Countywide
Stormwater Pollution
Prevention Program

Santa Clara Valley
Urban Runoff Pollution
Prevention Program

Vallejo
Sanitation and Flood
Control District

B A S M A A

February 20, 2004

Fred Hetzel
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: PCBs in San Francisco Bay Total Maximum Daily Load (TMDL) Project Report

Dear Fred:

This letter is submitted on behalf of the Bay Area Stormwater Management Agencies Association (BASMAA) in response to the invitation to submit comments on the Regional Board staff report dated January 8, 2004 entitled *PCBs in San Francisco Bay Total Maximum Daily Load (TMDL) Project Report* (hereinafter referred to as the Staff Report).

BASMAA member agencies appreciate this opportunity to comment on the Staff Report and commend Regional Board staff on the hard work put into preparing this document. We would also like to recognize the staff and participants of the San Francisco Estuary Regional Monitoring Program for Trace Substances (RMP) and Clean Estuary Partnership (CEP) for their contributions to this milestone.

BASMAA remains committed to addressing impairments to beneficial uses of San Francisco Bay Area water bodies impacted by urban runoff. We agree that reducing impairment of the Bay's beneficial uses by PCBs should be a high priority to all Bay Area public agencies and citizens. Accordingly, municipal stormwater programs have redirected a portion of our limited public resources over the past few years toward investigating the extent of PCBs in urban runoff and identifying sources and control measures. BASMAA member agencies also plan to continue allocating resources toward regional collaborations such as the RMP and CEP, which are designed to help collect scientific information necessary to develop cost-effective measures to improve water quality in the San Francisco Estuary. As public agencies we recognize the importance of this task, and therefore seek a fair, objective and transparent PCBs TMDL. A process based on the best available information, sound science, feasibility, and cost-effectiveness will help establish the legitimacy and legality of the TMDL and the public's confidence.

It is our understanding that Regional Board staff will consider comments such as these before developing PCBs TMDL-related amendments to the Water Quality Control Plan for the San Francisco Bay Region (Basin Plan). While we believe our exchange of information at this point in the process may be useful, we want to emphasize that notwithstanding this and prior public outreach efforts, the Regional Board needs to provide sufficient time for a meaningful official public comment process once a proposed Basin Plan amendment is prepared.

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Because of the significant implications of such an amendment, the demands it will impose, and the amount of time and public resources it will likely consume, we would like to emphasize that our current exchange of information will be no substitute for providing adequate time (in our estimation at least six to nine months) for meaningful peer review of and public comment on a proposed Basin Plan amendment. We also request, as was done with the Bay mercury TMDL, the opportunity to review, comment on and discuss with Regional Board staff and yourself an early draft version (i.e., before public release) of the sections of the PCBs Basin Plan amendment and related PCB actions relevant to urban runoff.

In addition, even though the Regional Board is exempt from certain provisions of the California Environmental Quality Act (CEQA) with respect to Basin Plan amendments, the Regional Board is still obligated to consider the potential environmental impacts of the proposed amendment in it's exempt regulatory process. CEQA policy stipulates that the Regional Board make available information relevant to the proposed amendment's impacts *"as soon as possible"* and considers comments *"at the earliest possible time in the environmental review process."* (See Public Resources Code § 21003.1.) The required CEQA analysis must be released early enough to allow BASMAA and other interested parties sufficient time to provide meaningful and useful comments to the Regional Board.

The Regional Board must also consider the economic impacts of any PCBs TMDL-related amendments to the Basin Plan, as well as the impacts that any amendment would have on the development of housing in the region. (See Water Code § 13241.) Unfortunately, the BASMAA member agencies that will be required to implement the urban runoff PCB reduction strategies are under severe budget restrictions, which have in many cases caused these agencies to cut back on important municipal services. In addition, the appellate court ruling in the Proposition 218 related case of *Howard Jarvis Taxpayers Association v. City of Salinas* has added further restrictions on the ability of local government to generate additional revenues for urban stormwater programs. Thus, it is particularly important for the Regional Board to recognize financial constraints on local agencies and to provide flexibility to ensure that water quality objectives and implementation measures are economically attainable and technically feasible.

Finally, the proposed implementation plan in the Staff Report includes potential new categories of actions that will affect municipal stormwater programs. The Staff Report states (p.59):

"We propose that an adaptive implementation plan be developed for each source category or by each individual discharger for which we have proposed load or wasteload reductions. This plan should present available alternatives for PCBs load and wasteload reductions, a schedule for implementing the selected alternative(s), a mechanism for evaluating the efficiency of implemented mass reductions, and a process for corrective action/modification of the implemented activities."

We concur with this proposal and stormwater agencies have generally been supportive of linking implementation planning with TMDL development; however, BASMAA also strongly desires that implementation policies, actions and schedules be developed in a separate but parallel process from development of the TMDL (i.e., calculation of acceptable loading and allocations) and its approval by USEPA. BASMAA also strongly desires that implementation planning, with respect to municipal stormwater, be conducted in a manner consistent with the maximum extent practicable standard set forth in the Clean Water Act (CWA). (33 U.S.C. § 1342(p)(3)(B).) Separating the TMDL per se from related implementation considerations will allow the Regional Board to more expeditiously submit the former for approval by USEPA (which is not required to review or approve implementation aspects of TMDLs under the CWA)

and, by so doing, will preserve the State's maximum authority and flexibility to work with local governments on addressing the challenges that will be presented.[1]

BASMAA also seeks clarification on the process for preparation of an adaptive implementation plan, particularly given the current schedule of the PCBs TMDL and Basin Plan amendment. The details of the adaptive management process need to be set forth for consideration, including:

- How stakeholder and regulator actions, such as Regional Board staff review of new information as it becomes available, will be coordinated and scheduled; and

- Mechanisms for revising loads, allocations and implementation actions as new information becomes available (e.g., information on the feasibility of meeting allocations and targets).

Sufficient time will be needed to prepare such a plan, given the considerable effort and coordination among BASMAA municipalities that will be required. We therefore request that Regional Board staff from the TMDL section and stormwater permitting section meet with BASMAA representatives as soon as possible to discuss the schedule and process related to adaptive implementation and preparation of related plans. This would also provide the opportunity to discuss other issues raised in this letter, and to discuss how implementation of the PCBs TMDL will be coordinated with disparate related requirements in individual stormwater agency NPDES permits. Our goal is to work cooperatively with Regional Board staff to reach common ground in establishing this important TMDL and in developing, preferably in a separate stage, an implementation plan and adaptive management process.

The preliminary comments in this letter are intended to be constructive; in general, specific suggested improvements are provided for each issue discussed. We request that Regional Board staff incorporate our suggested improvements into a revised PCBs TMDL Project Report, rather than addressing them at a later stage in the process (e.g., the staff report supporting the PCBs TMDL Basin Plan amendment). We believe that our recommended changes are significant enough to warrant a revised PCBs TMDL Project Report, especially since the transition to the Basin Plan amendment and supporting staff report is generally a contraction in

1 The CWA recognizes the authority and sovereignty of the states by distinguishing between the process of establishing TMDLs and the process of implementing TMDLs, and by providing states with flexibility and independence to implement TMDLs. The CWA requires that each TMDL, which includes one or more numerical targets that represent attainment of the applicable standards and the allocation of the target or load among the various sources of the pollutant, be reviewed and approved by the U.S. EPA. (33 U.S.C. § 1313(d).) However, the CWA gives states the flexibility to implement TMDLs as they see fit, without requiring that TMDL implementation plans be approved by USEPA. Instead, the implementation of TMDLs is governed by state law, such as section 13242 of the Porter Cologne Act, which requires a program of implementation to achieve water quality objectives.

In order to satisfy its directive under the Porter Cologne Act, the Regional Board should separate the process of establishing (developing and approving) the PCBs TMDL and other TMDLs from the process of developing implementation plans for TMDLs. The Porter-Cologne Act requires the Regional Board to consider factors in addition to the considerations mandated by the CWA. When developing implementation plans for TMDLs, the Regional Board must take into account beneficial uses of the impaired waters, environmental characteristics of the hydrographic unit under consideration, reasonable limitations on water quality conditions, economic considerations, the need for developing housing, and the need to develop and use recycled water. (Water Code § 13241.) In contrast, USEPA is not required to consider all these factors. Therefore, to maintain the flexibility and independence to implement the PCBs TMDL and other TMDLs in accordance with the considerations required by the Porter-Cologne Act, the Regional Board should separate the process into two parallel stages and documents, developing the TMDL, subject to USEPA approval, and developing the TMDL implementation in a separate process.

the amount of information presented. The documentation supporting the PCBs TMDL, as reflected most comprehensively in the PCBs TMDL Project Report, should be revised and expanded first.

Our specific comments follow with references to specific sections and pages of the Staff Report.

Section 2.3. Production and Uses

The Staff Report should mention that there is anecdotal evidence that PCB-containing oils were used for dust control. The Staff Report should also state that the use of hydraulic fluids containing PCBs had significant potential to result in releases to the environment, since hydraulic systems were designed to leak slowly to provide lubrication (Binational Toxics Strategy. *Draft Options Paper: Virtual Elimination of PCBs.* U.S. EPA Great Lakes National Program Office. October 1998).

Equipment in the Bay Area that potentially contains PCBs includes PG&E electrical equipment with dielectric fluids, such as substation transformers. A letter from PG&E to Regional Board staff (Doss, R. Letter from Pacific Gas and Electric Company to Lawrence B. Kolb, Acting Executive Officer, California Regional Water Quality Control Board, San Francisco Bay Region. September 1, 2000.) indicates that the *"vast majority of PCB-filled electrical equipment"* was removed from its system during the mid-1980s. The letter also states*: "Distribution line equipment and all other fluid-filled substation electric equipment contains mineral oil dielectric fluid. ...The over 900,000 mineral oil-filled distribution line pieces of equipment in service are generally not tested for PCBs until fluid is removed at the time of servicing, or in the event of a spill or release of such fluid. PG&E's experience has been that, in general, approximately ten percent of such units contain PCBs at concentrations of 50 parts per million (ppm) or greater, and fewer than one percent of these units contain PCBs at concentrations of 500 ppm or greater."* A follow-up letter (Doss, R. Letter from Pacific Gas and Electric Company to Loretta K. Barsamian, Executive Officer, California Regional Water Quality Control Board, San Francisco Bay Region. December 21, 2000) states*: "The declining percentage of oil-filled units which contain PCBs reflects our efforts to remove such units during servicing, as well as the replacement programs PG&E conducted in the mid-1980s."*

The Staff Report should include a discussion of PG&E's historic and current use of PCBs. Furthermore, the Staff Report should acknowledge the need for additional documentation of the current status of PG&E's efforts to remove PCBs from their equipment, the fate and management of such removed equipment, and the past, current, and future potential for PG&E equipment (removed and in-service) to release PCBs to the environment.

Section 4. Impairment Assessment

Although the Staff Report is specific to PCBs pollution in San Francisco Bay, PCBs pollution and bioaccumulation in surface waters in other parts of the United States should be discussed to provide context and the basis for comparison in terms of future improvement and adaptive management.

Section 5.2. Sources and Loads

The Staff Report uses estimates of stormwater loads of PCBs into the Bay (p.40) to help establish the urban runoff load allocation. The estimates are from the Joint Stormwater Agency Project report (Kinnetic Laboratories, Inc. *Final Report, Joint Stormwater Agency Project to*

Study Urban Sources of Mercury, PCBs, and Organochlorine Pesticides. April 2002). These estimates are highly uncertain and were based on concentrations of pollutants in bedded stormwater conveyance sediments. The associated assumptions and uncertainties are described in the Joint Stormwater Agency Project report, but not in the Staff Report. San Francisco Estuary Institute staff has more recently commented that it is not possible to determine the bias and error associated with loading estimates based on bedded sediment concentrations. BASMAA therefore strongly believes that load estimates based on concentrations in bedded stormwater sediments are inappropriate as a basis for establishing regulatory criteria or actions and that the TMDL should not be based on them.

Section 6.2. Sediment Target

The sediment target presented in the Staff Report is preliminary and likely to change based on the results of food web numeric modeling. As the Staff Report states (p. 52):

"The continued development of the food web model will enhance our ability to predict protective PCBs sediment concentrations."

The term "sediment target" should therefore be changed to "preliminary sediment target" throughout the Staff Report, and the Regional Board should not adopt the PCBs TMDL until the results of the food web numeric modeling are obtained.

Section 7.1. Mass Budget Model

The linkage analysis relies on a simple one-box mass budget model. Limitations of this model include (Davis, J.A. *The Long Term Fate of PCBs in San Francisco Bay.* RMP Technical Report 66. San Francisco Estuary Institute, Oakland, CA. 2003):

- The model does not account for how processes such as pollutant loading and sediment transport vary among different Bay segments.

- Currently there is a significant discrepancy between direct estimates of PCBs loads to the Bay and estimates based on the model, highlighting the current uncertainty in the model's predictions.

- An uncertainty analysis was not conducted during the modeling. Such an analysis would provide more information on how the model's predictions vary with the uncertainty and variability in input parameters.

A multi-box fate model currently under development will supersede the simple one-box mass budget model. The Staff Report should therefore be revised to clarify that the linkage analysis is preliminary. In addition, the Staff Report should clearly describe the limitations of the one-box model, including those listed above. This would help inform stakeholders and the public about the current uncertainty in both our understanding of the fate of PCBs in the Bay and how recovery of the Bay would be affected by management actions and associated reductions in loads.

BASMAA acknowledges that the multi-box fate model under development will help address the above limitations. As the Staff Report makes clear, the TMDL should incorporate the results of the multi-box fate modeling when they become available. In addition, the implementation plan

and adaptive management process should be developed using the results of the multi-box fate modeling in a separate but parallel process to USEPA approval of the TMDL.

Section 8. Total Maximum Daily Load

Erosion of sediments containing historically released PCBs from the bed of the Bay may make a significant contribution to impairment of the Bay's beneficial uses. The Staff Report does acknowledge this issue by stating (p.7):

"Recent studies indicate that, in portions of the Bay, sediments are eroding (Jaffe et al., 1998). Sediments deposited during the period of Bay Area industrialization are now being uncovered due to a decrease of sediments entering the Bay from the Sacramento and San Joaquin rivers. This erosion could uncover contaminated sediments, resulting in increased availability of PCBs to the food web. Even if all current PCBs sources to the Bay are eliminated, exposure of historically contaminated sediment may turn out to be a significant PCBs source to organisms."

and on p.9:

"Bay sediment dynamics need to be incorporated in the long-term modeling of PCBs' fate in the Bay. Further modeling of sediment transport and information of past erosion/deposition patterns are needed."

BASMAA acknowledges that data on erosion and deposition in the Bay are currently limited; however, this does not preclude including estimates of loading due to bed erosion. Regional Board staff recently made similar estimates in the June 6, 2003 *Mercury in San Francisco Bay Total Maximum Daily Load (TMDL) Project Report*. The Staff Report should include estimates of PCBs loading due to bed erosion for all applicable segments of the Bay. Furthermore, as was done in the above mercury TMDL report, an allocation should be assigned to this source category. The load estimate and associated allocation should be reflected in Table 27 and Figure 22, which illustrate estimated loads and proposed reductions. This will help make explicit the potential importance of this source category and its potential impact on the recovery time of the Bay.

Section 8.1. Wasteload Allocations

The Staff Report states (p.56):

"We will develop a proposed timeframe to reduce urban runoff loads via an adapted implementation strategy to comply with this proposed allocation."

This sentence should be revised as follows: "We will work with Bay Area stormwater agencies to develop a proposed timeframe to reduce urban runoff loads to the maximum extent practicable via an adapted implementation strategy to address this proposed allocation over time."

Section 9.1. Load and Wasteload Allocations

<u>Feasibility</u>

The Staff Report states (p.60, 61):

"The wasteload allocations for urban runoff will be implemented through municipal stormwater NPDES permits. We propose to implement the total wasteload allocation of 2 kg/yr as an annual load reduction of 32 kg/yr. Individual wasteload allocations and corresponding annual load reductions derived from the total wasteload allocation will be applied to each municipal stormwater management program.

We will consider three implementation options:

1. *Demonstrate attainment of the sediment target in discharges;*
2. *Demonstrate load reductions in discharges; and*
3. *Demonstrate loads removed by actions taken.*

We expect PCBs management and control actions within a three-tiered strategy that includes:

1. *Cleanup of hotspots on land, in storm drains, and in the vicinity of storm drain outfalls;*
2. *Capture, detention, and treatment of highly contaminated runoff; and*
3. *Implementation of urban runoff management practices and controls that have PCBs removal benefit.*

More specifically, tier one includes:

- *On-land removal or control of PCBs sources that would otherwise discharge into the runoff drainage system;*
- *Removal of PCBs contaminated materials already within the urban runoff drainage system; and*
- *Removal or reduction of bioavailability of PCBs contaminated materials at localized discharge points of urban runoff drainage systems.*

We will consider and seek input on appropriate time schedules and possible interim load reduction or removal levels as we continue to develop implementation requirements."

The feasibility of meeting the above load allocation is highly questionable given the wide distribution of sources (most of which are unknown), lack of control by urban runoff programs over many sources (e.g., on-land polluted sites), and potentially prohibitive cost of treating runoff from all such sites. BASMAA's July 22, 2003 comments on the June 6, 2003 *Mercury in San Francisco Bay Total Maximum Daily Load (TMDL) Project Report* included the following language that is highly relevant to the PCBs TMDL:

"Prior to the adoption of other TMDLs, we suggest that when calculating current loads and waste load allocations the Board should adopt a definition of controllable and uncontrollable sources based on factors such as feasibility, economic capacity, and legal jurisdiction of the dischargers."

The Staff Report should state that the above proposed load reductions and implementation actions for urban runoff dischargers are preliminary and contingent on an analysis of cost and feasibility. This analysis will be conducted during development of adaptive implementation plans, and will reflect a commitment by Bay Area municipalities to implement actions that meet the maximum extent practical standard.

Furthermore, even if the proposed urban runoff load reductions prove feasible and were achieved, there is currently little certainty that water quality objectives would be met. The Staff Report should acknowledge this uncertainty, and expressly acknowledge that natural attenuation of on-land and in-Bay PCBs concentrations will likely play an important role in implementation of the PCBs TMDL.

Remediation of Areas with Elevated PCBs

BASMAA acknowledges that remediating selected on-land (p.60) and in-Bay areas at storm drain outfalls (p.61) with elevated PCBs may be part of implementation of the Bay PCBs TMDL. However, these actions should *not* be pursued through municipal stormwater NPDES permits. Other regulatory programs and funding sources (e.g., Proposition 13 and the State Cleanup and Abatement Account) clearly exist, present reliable enforcement mechanisms, and should instead be used by the Regional Board. Existing models used to cleanup polluted sites (e.g., CERCLA and site cleanup requirements issued by the Regional Board under the California Water Code) should be applied, which include identifying the real responsible parties whenever possible. Some sites are currently being cleaned up under such programs; the Staff Report should discuss the need to establish coordination between these programs and the PCBs TMDL.

One example is the Delta Star site in the City of San Carlos in San Mateo County. Relatively high levels of PCBs were found in a storm drain sediment sample collected by BASMAA agencies downstream of this site. Electrical equipment containing PCBs was formerly manufactured at the Delta Star property and PCBs have been found in soil and groundwater at the site. Thus this site may be a source of PCBs in storm drain sediments. The Regional Board is the lead agency overseeing an ongoing site cleanup.

For a few sites that have been identified to date (such as Delta Star), BASMAA agencies have already requested that Regional Board staff work with appropriate parties (e.g., PG&E, the Department of Toxic Substances Control and non-TMDL staff within the Regional Board) to investigate the possibility that PCBs have entered storm drains. The Staff Report should acknowledge and distinguish this type of issue from those that are appropriately addressed directly through municipal stormwater program activities, both in the context of current cleanup sites and sites that may be identified in the future.

Central Valley Inputs

The Staff Report states (p.61):

"Central Valley inflow contributes a significant PCBs mass to the Bay. However, suspended sediment PCBs concentrations entering the Bay from the Central Valley are lower than concentrations in Bay sediments and are possibly improving Bay ambient conditions by depositing over more contaminated in-Bay sediments. Also, sediment PCBs concentrations carried in the drainage of the Central Valley may be difficult to control, and at this time, we do not expect PCBs load reductions from Central Valley inputs. Still, the PCBs concentration of suspended sediments is greater than the sediment PCBs target. Eventual reductions of this load are expected as sediment concentrations naturally attenuate over time."

The Staff Report provides no support for the assertion that PCBs loads from the Central Valley drainage would be difficult to control relative to loads associated with local tributaries. In addition, the rationale for not requiring load reductions from Central Valley inputs at this time is unclear, and appears inconsistent with the previously assigned load reduction (Table 27). In the interest of implementing a fair and objective TMDL, the Staff Report should include implementation actions for Central Valley inputs that are consistent with actions required of local dischargers.

Section 10. Monitoring

With regard to monitoring the effectiveness of implementation actions, the Staff Report states (p.62):

"Urban Runoff - We expect that PCBs load reductions will be quantified in sediments removed from conveyance systems, in sediments discharged to the Bay, and evaluation of management practices and controls."

Requiring all of these monitoring actions would not be consistent with the flexibility demonstrated in the Staff Report by providing three implementation options (p.60):

"We will consider three implementation options:

1. *Demonstrate attainment of the sediment target in discharges;*
2. *Demonstrate load reductions in discharges; and*
3. *Demonstrate loads removed by actions taken."*

The Staff Report should present options for monitoring actions that are consistent with the delineated implementation options. Furthermore, costs associated with quantitative monitoring, particularly on a pollutant-by-pollutant basis, may be extremely high. Given our limited resources, it is important that Bay Area stormwater agencies be allowed to maintain a reasonable balance between implementing controls and monitoring actions.

As with implementation actions, the Staff Report should state that proposed monitoring actions for urban runoff dischargers are preliminary and contingent on an analysis of cost and feasibility. This analysis should once again be part of a separate, but parallel process from USEPA approval of the TMDL, focused on the proper development of adaptive implementation plans. At that appropriate time, BASMAA agencies would very much like to work with Regional Board staff to help identify and further clarify proposed implementation and monitoring actions associated with the PCBs TMDL.

We hope you find these preliminary comments and suggested improvements to the Staff Report useful. As mentioned previously, we request that Regional Board staff from the TMDL section and stormwater permitting section meet with BASMAA representatives as soon as possible to discuss the schedule and process related to adaptive implementation and other issues raised in this letter.

Please contact me at (925) 313-2373, Jon Konnan (BASMAA representative to the Clean Estuary Partnership) at (510) 832-2852, or Geoff Brosseau (BASMAA Executive Director) at (510) 622-2326 if you have any questions regarding the comments or suggested revisions.

Very Truly Yours,

Donald P. Freitas
Chair - BASMAA Executive Board

cc: BASMAA Executive Board
Jim Scanlin, Alameda Countywide Clean Water Program
Kevin Cullen, Fairfield-Suisun Urban Runoff Management Program
Liz Lewis, Marin County Stormwater Pollution Prevention Program
Bob Davidson, San Mateo Countywide Stormwater Pollution Prevention Program
Adam Olivieri, Santa Clara Valley Urban Runoff Pollution Prevention Program
Bob Oller, Sonoma County Water Agency
Jack Betourne, Vallejo Sanitation & Flood Control District
Arleen Feng, BASMAA Monitoring Committee Chair
Tom Mumley, San Francisco Bay Regional Water Quality Control Board
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Andy Gunther, Clean Estuary Partnership
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February 20, 2004

Mr. Fred Hetzel, Environmental Scientist
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: PCBs in San Francisco Bay – TMDL Project Report

Dear Mr. Hetzel,

The Bay Planning Coalition (BPC) is very pleased to submit comments on the PCBs in San Francisco Bay, TMDL Project Report. The development of a TMDL is a very complex scientific and policymaking process, and BPC would like to congratulate the RWQCB on this accomplishment.

While BPC generally supports much of the general approach utilized by the RWQCB in the development of the PCBs TMDL, we do have some concerns regarding significant inconsistencies between the previous Mercury TMDL and PCB TMDL, as well as concerns regarding certain technical aspects of the TMDL process. Below are some comments on the TMDL approach that BPC would like to see incorporated into any finalization of this TMDL, future TMDLs and/or subsequent Basin Plan amendments.

1) General accounting of sources and losses

BPC does not agree with the general accounting of sources/losses of PCBs in the Bay. In previously submitted comments and meetings with the RWQCB, BPC members and colleagues demonstrated that in-bay dredging and disposal has a net zero loading allocation. At that time, the RWQCB agreed that "in-bay" dredging disposal should ***not*** be considered a "source". In fact section 5.3, "Movements of PCBs", states that "…dredged material disposal does not increase the mass of PCBs in the Bay…". The narrative in this paragraph further states that the mass of PCBs 'moved' by in-bay disposal are "small" relative to the suspension and deposition assumed for the active layer.

Nevertheless, in all subsequent sections of this TMDL, in-bay dredge disposal is accounted as a loading source. This is contrary to the fundamentals of mass-balance modeling and is not consistent with the TMDL approach established in the Mercury TMDL.

Similarly, in previously submitted comments and meetings with the RWQCB, BPC presented information demonstrating that the natural transport of sediment through the Golden Gate is a significant net loss; to which the RWQCB again agreed and incorporated into the Mercury TMDL. Nevertheless, the natural transport of sediment through the Golden Gate is not identified as a net loss in the PCB TMDL.

2) **Derivation of the numerical target for sediment PCB concentrations.**

One of the most important elements of any TMDL is the establishment of "numerical targets". In this TMDL, the RWQCB did not derive a sediment numerical target that is reflective of the conditions in San Francisco Bay, but rather, adopted the EPA's screening value of 2.5 µg/kg total PCBs (as established in their National Sediment Quality Survey). This raises several policy and technical concerns. At the February 10, 2004 CEQA scoping meeting, RWQCB staff indicated that this number is simply a target or goal, not a sediment clean-up level. However, as one member of the commenting public aptly summed it, "today's targets are tomorrow's litigation". Any number published in an agency report should be based on sound science and appropriately applied. A detailed memo of our technical concerns is attached. In summary, however, BPC believes the sediment numeric target is overly conservative as it is based on the assumption that the toxicity of all PCBs is equivalent to the toxicity of the worst PCB.

3) **Implementation actions for sediment and dredge material disposal**
The dredging implementation component of the PCB (and Mercury) TMDL is based on the subscription to the LTMS 40% ocean, 40% upland and beneficial reuse and 20% in-bay dispsoal plan. The dredging community diligently works towards achieving the LTMS disposal plan and is making good progress. However, the plan is a disposal target, not a regulation. Reaching this target is, in part, dependent on variables beyond the control of dredgers, such as a timely permit process and available funding. Thus, TMDL implementation plans should not explicitly require that the dredging community adhere to the 40-40-20 plan because we can only achieve it if it is financially and practically feasible to do so, and that permits are approved.

4) **Editorial formatting and data inconsistencies**.

The RWQCB is working diligently and swiftly in developing these TMDLs as required by law. We applaud these efforts and feel that great strides have been made in developing a TMDL process and approach. As a general practice, we believe it would be beneficial to the reader (and writer) for all reports to be organized in the same format. It would also be beneficial to use the same verbage in reports when referring to common elements (e.g. the geology, climate and geography of San Francisco Bay, the explanation of dredging operations and LTMS, etc.).

Specific inconsistencies have also been noted within, and between, the Mercury and PCB TMDL reports. For example:

a. On page 12 of the PCB TMDL, general sediment movement in the Bay is quantified in units of 10^6 cu yds in Table 2, whereas in Table 3, dredged sediment disposal is quantified in units of cu yds. Apart from the general editorial issue of needing to employ similar units, this is

more problematic in that it gives the subjective impression that the amount of dredged sediment disposal is much, greater than other sediment movements in the Bay (i.e., the Table 3 numbers "look much bigger" than do the Table 2 numbers).

b. The data sets used to calculate the volume of in-bay dredged material disposal are different between the Mercury and PCB TMDL reports. The two TMDLs were written in the same general timeframe and should reflect the most current, and same, data sets.

Finally, we have one general comment to be considered when developing future TMDLs. As the Bay and watershed is a dynamic ecosystem, individual TMDL criteria and implementation plans must be developed to ensure that the plans are complementary and provide for adaptive environmental management. We look forward to participating in the TMDL program in the future to ensure the integration of sound science and the balancing of economic and environmental policy goals.

Sincerely yours,

Ellen Joslin Johnck

Ellen Joslin Johnck
Executive Director

Cc: LTC Michael McCormick, San Francisco District Engineer, U. S. Army Corps of Engineers
Alexis Strauss, Director, Water Quality Division, U. S. EPA
William Travis, Executive Director, S. F. BCDC
Ms. Celeste Cantu, Executive Officer, State Water Resources Control Board

BAY PLANNING COALITION

Attachment A

PCB TMDL
Technical Evaluation of the Numeric Sediment Target

BPC has a number of technical concerns with the development and adoption of the numeric sediment target in the PCB TMDL. In short, the numeric target was based on the assumption that the toxicity of all PCBs is equivalent to the toxicity of the worst PCB and BPC feels that this is overly conservative.

a. *The EPA's derivation of the 2.5 µg/kg sediment screening value is not consistent with the RWQCB's fish tissue numerical target of 22 ng/g.*
The basic approach used by the EPA was to use the Theoretical Bioaccumulation Potential (TBP) model to calculate ***from*** the target fish tissue concentration ***to*** the target sediment concentration as follows:

$$(C_{ft}/f_l) = BSAF\ (C_s/f_{oc})$$

where: C_{ft} = target fish tissue concentration,
f_l = fish tissue lipid content, as a decimal fraction (e.g., 3% = 0.03)
C_s = target sediment concentration,
f_{oc} = sediment organic carbon content, as a decimal fraction (e.g., 1% = 0.01)
BSAF = Biota Sediment Accumulation Factor (EPA used value of 1.85).

However, the EPA's derivation of a sediment screening value did not use the San Francisco Bay fish tissue screening value! To determine what the sediment numerical target *should be* for San Francisco Bay, we can plug the RWQCB's fish tissue numerical target concentration (22 ng/g [=22 µg/kg]) into this equation:

$$(22\ \mu g/kg)/0.03 = 1.85(C_s/0.01)$$

solving for C_s =

$$C_s = (0.01/1.85)(22\ \mu g/kg)/0.03 = 4.0\ \mu g/kg$$ (***not 2.5 µg/kg!***)

This correction of the sediment numerical target to reflect the RWQCB's fish tissue numerical target has profound consequences upon all subsequent mass-balance modeling efforts.

b. *The adoption of a sediment target based upon the EPA's risk factor is overly conservative.*
In deriving their sediment screening concentration, the "EPA applied the cancer slope factor for aroclor 1260, the most potent commercial mixture, to all measures" of PCBs (i.e., the cancer risk estimation was based upon the assumption that the toxicity of all PCBs are equivalent to the toxicity of the worst PCB). However, the actual risk associated with other aroclors can be an order of magnitude, or more, less toxic! Comparisons of the actual risks of different congeners (using the TEF approach) reveals that there can be differences in toxicity as great as 4 orders of magnitude! As a

result, the RWQCB's adoption of the EPA screening value is overly conservative in estimating the actual human health risk posed. BPC recognizes that the current limited data set of PCB analyses of Bay sediments and fish tissues constrains their ability to generate technically accurate evaluations of risk, but believes that this issue should be acknowledged in the TMDL report, and that formal mechanisms need to be in place to allow for modification of the numerical target as better data become available, and/or to allow for regulators to incorporate new information into future decisions regarding "compliance" with the TMDL implementation.

c. *The adoption of the EPA's use of other default modeling parameters precludes the numerical targets from reflecting site-specific conditions in San Francisco Bay*

In their use of the TBP model, the EPA used default values of 3% lipids in fish tissues, 1% organic carbon in sediments, and a BSAF of 1.85. While arguably appropriate as "generic" values, these values may not represent actual conditions in San Francisco Bay. In fact, the RWQCB does acknowledge that, except for the white croaker, fish tissue lipids in San Francisco Bay are typically <3%, resulting in a numerical target that is overly-protective, given actual Bay conditions.

The RWQCB states that organic carbon concentrations in the Bay "are generally around 1%". The basis for this assertion is not stated. Presumably, this is based upon the RMP data set for sediment analyses performed 1993-2001. However, it is important to note that the RMP stations during that period were located primarily along the spine of the bay where the relatively higher-energy environment can be expected to favor coarser sediment particles and lesser organic carbon, and that the sediment organic carbon can be expected to increase as one moves towards the margins of the Bay. The Bay Protection and Toxic Cleanup Program reported a mean sediment TOC concentration of 1.43% for the San Francisco Bay reference sites (Hunt et al. 1998), which would result in a significant increase in the sediment PCB concentration numerical target for San Francisco Bay.

Table 1. SF Bay BPTCP Reference Site sediment TOC characteristics.

mean	s.d.	range	n
1.43%	0.65	0.74-4.32	43

Furthermore, sediment PCB concentrations will co-vary positively with sediment organic carbon. As a result, it seems likely that the actual average sediment organic carbon concentrations in San Francisco Bay are >1% (particularly in those areas at which there are elevated PCB concentrations), and that as a result, there will be reduced bioavailability and concomitant reduced bioaccumulation of PCBs than is predicted by the EPA TBP modeling.

Similarly, the use of a BSAF value of 1.85 may not reflect actual San Francisco Bay sediment bioaccumulation characteristics. Recent studies have indicated that the bioaccumulation of PCBs by sediment-ingesting organisms can vary significantly between sites due to the different bioavailabilities exhibited by different types of

sediment organic carbon: The descriptive statistics for PCB BSAFs from the US Army Corps of Engineers Engineer Research and Development Center Waterways Experimental Station (ERDC WES) BSAF database are summarized in Table 2, and similarly indicate a high degree in variability of BSAFs between sites.

Table 2. Summary of characteristics of PCB BSAFs from the US ACOE ERD WES BSAF database.

Source	Mean	SD	n	Range	Median
Field	1.70	2.10	293	0.01-11.0	0.79
Lab	1.18	0.97	206	0.04-4.74	0.80

This is of significant concern as the actual site-specific bioaccumulation of PCBs may be markedly less than the "predicted" bioaccumulation. This concern is evidenced here in San Francisco Bay by recent efforts to model PCB bioaccumulation from sediments based upon "traditional" equilibrium partitioning approaches. In the Gobas Food Web model (referenced in Section 7.2 of the TMDL report), the actual bioaccumulation of PCBs in benthic invertebrates was markedly less than each of the predicted PCB congener concentrations, and 44% of the PCB congeners that were predicted to be elevated in the tissues could not even be detected! This empirical data suggests that the site-specific conditions in San Francisco Bay do, in fact, result in less bioaccumulation than is predicted using the traditional modeling approaches, and that the predicted sediment numerical target of 2.5 µg/kg is overly-protective.

BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Transmitted Via e-mail

March 2, 2004

Mr. Fred Hetzel
1515 Clay Street
Suite 1400
Oakland, CA 94612

Re: TMDL Project Report for PCBs in San Francisco Bay

Dear Mr. Hetzel:

Blasland, Bouck, and Lee, Inc. is pleased to submit these comments on the draft PCBs in San Francisco Bay, Total Maximum Daily Load Project Report (PCB TMDL Report) to the San Francisco Regional Water Quality Control Board (RWQCB). We appreciate the opportunity to provide comments on the PCB TMDL based on our experiences with PCB remediation in SF Bay in order to contribute to the important material offered in this report.

General Comments:
In general our major concern with the PCB TMDL Report is that it establishes a numeric target for sediment. This numeric target could be promulgated and made into ARARS on sites requiring cleanup. The proposed level of 2.5 ug/kg has not been critically reviewed to ensure that this goal is necessary to reduce fish tissue concentrations to safe levels. Establishing such a low level would have far reaching negative impacts such as potential 3rd party lawsuits, unachievable toxic hotspot cleanup levels, and marina closures.

It is our understanding that this level is based on the 1997 USEPA fish consumption study that relies on nationwide data. This study is not Bay specific and does not account for differences in Bay specific input parameters such as TOC, fish consumption, rates, and lipoid concentration of the sport fish that inhabit the Bay. Furthermore, the food web model used to calculate the sediment target concentration has not been published and therefore, there has been no opportunity for public review or comment. Once the food web model report has been completed, the assumptions used to develop the BSAF should be verified to ensure that the target sediment level is appropriate before dischargers and other Bay users are asked to spend money cleaning up to levels that may not be necessary. Additionally, while we believe the report provides a qualitative understanding of the potential sources of PCBs, additional information is needed before quantitative goals and percentage reductions can be established.

We believe that all technical documentation used to support the PCB TMDL Report should go through public comment. We would like to opportunity to review and comment on these documents when available.

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Specific Comments:
Problem Statement
Section 1.2 *Climate*: wind generated waves re-suspend sediments and cause turbid conditions dispersing sediment through out the bay. What about currents? Is there is a difference between the contribution of PCBs to fish tissue in near shore, shallow environments and deep bay? What about the sediment loss through the Golden Gate? The mass loss of PCBs out of the Bay must be included in the evaluation. This is especially important due to the amount of maintenance dredging material being deposited at the Alcatraz disposal site.

Section 1.4 *Geology*: Although in some portions of the Bay sediments are eroding, some parts of the Bay are in a depositional environment and would naturally cap the PCB bearing sediments below the "active" layer. Both the increase and decrease in PCB mass needs to be accounted for in the mass balance of PCBs in the Bay. Only the sources of PCBs from eroding areas have been included in this evaluation.

Section 1.5 *Biology:* Modeling of the transfer of PCBs in the Bay food web has begun; however this is a vital step to understanding how the ambient concentrations affect the fish and where the exposure to PCBs occurs. There is no evidence that the ambient concentrations of PCBs in sediment (25-35ppb) have contributed to the elevated levels of PCBs in fish tissue. We believe that PCBs may accumulate in fish tissue during the juvenile stages when the fish are living in the margins of the bay where the PCB concentrations are higher. A better understanding of how, where, and at what concentrations of PCBs in sediment and water causes fish tissue exceedances need to be defined before a numeric target can be established.

Section 3 *Applicable Water quality standards:* "PCBs concentrations in the Bay waters are generally below the CCC water quality standard, indicating that current conditions are protective of aquatic life from chronic toxicity. We therefore propose to use the more protective human health criterion as the applicable water quality standard for the PCBs TMDL." Is this appropriate or defensible? If a new water quality criteria is to be established it requires the same scientific and economic evaluation of any other AWQC. Doesn't this phenomenon require additional study to evaluate whether natural attenuation is effective?

Section 4.2 If bivalve tissue concentrations of PCBs and fish tissue PCBs have bee decreasing over time what is the argument for reducing the PCB load by an order of magnitude.

TMDL Development
Section 5.2
Central Valley:
Minimal reductions from Delta however this is largest PCB load to the Bay.
Municipal and industrial wastewater discharges:
Not enough sampling done to demonstrate that additional reductions are not necessary.
Runoff and local tributaries:
The source contribution from upland as well as in Bay must be better understood. We recommend that the sources be further evaluated to identify and rank the largest contributors and most cost effective reduction reductions. This will ensure that the highest priority sources will be reduced. For instance, at Richmond Field Station there is an old system of storm water drainage where we found elevated PCB concentrations. By removing this historic source before it reached the Bay, we were able to quickly and relatively inexpensively control a major source of PCB contamination to SF Bay. This was a cost

effective way to control a source. Based on this experience we recommend that storm drain and combined sewer outfall piping be tested to identify these ongoing sources. It is much more cost effective to stop the source before it reaches the Bay then to clean it up once it enters the Bay.

Dredged Material Disposal
"Disposal of dredged materials at in-Bay dispersive sites is likely to spread the previously buried sediments across the surface of the sediment-water interface (the biologically active zone). Although dredged material disposal does not increase the mass of PCBs in the Bay, increased PCBs bioavailability may result from the dispersal of the dredged material on the surface sediment layer in the Bay. Increased bioaccumulation of PCBs by aquatic organisms may occur if the disposed dredged material has higher PCBs concentrations than the sediment it is covering."

Maintenance dredging should be considered in a different light as this activity produces no net-gain on PCBs. In fact, this activity removes sediment containing PCBs from the shallow bay margins where it is readily available and with in-bay disposal moves it to deeper, less bioavailable location. In addition there should be discussion of the net loss of sediment containing PCBs which migrates out of SF Bay due to the disposal of these sediments at Alcatraz.

Many sources of PCBs are described and discussed in the PCB TMDL; however there is no discussion of PCB sinks and natural capping of sediments containing PCBs. This reduction of PCBs in the active layer must be further studied; mass reduction quantified, and accounted for in the load reduction allocation.

Section 5.4 Two major sources of PCB mass come from the Delta and urban stormwater runoff. However TMDL implementation focuses on controlling urban runoff and release from sediment "hotspots" because it may be easier to identify a party to address these areas. This ongoing source contribution must be targeted for reduction.

Section 6.1 Numeric Targets
Fish Tissue:
The development of the fish tissue and sediment target is very confusing and seems to have inconsistencies. For example, the fish tissue target is based on a cancer slope factor of 1 mg/kg-day while the CTR numeric water quality objective protective of humans is based on the more recent cancer slope factor of 2 mg/kg-day. These cancer slope factors are also inconsistent with those used to develop the sediment target (from USEPA 1997).

There are also a number of potential issues with the use of 0.032 kg/day as an estimate of a mean daily consumption rate. These may result in a large overestimation of the consumption rate. The 32 g/day estimate represents the 95th percentile in the distribution of consumption rates of SFO Bay fish consumers. It is a highly skewed distribution (the 70th percentile is zero, meaning that 70% of the respondents have a consumption rate of 0 g/day) and the use of such a skewed value is not representative of the overall population. This would result in a target that is biased toward the most extreme 5 percent of the population. Other concerns with the consumption rate used include:

- The avidity adjustment is much smaller than the adjustment found in other studies and the authors admit that the results likely reflect an upward bias.
- Gender bias: approximately 86% of the survey respondents were men, the resulting consumption rates are not likely to represent the overall population of SF Bay consumers.
- The portion size model used by interviewers likely introduces upward bias into the consumption rates.

- The 32 g/day represents consumption of all SF Bay fish. When this estimate is applied to any one species of fish, this introduces additional error into the TMDL analysis. For example, only 28 percent of the respondents report eating white croaker.
- The sampling design of the study (selection of most popular fishing sites, oversampling of weekends) may introduce additional upward bias in the consumption results.

Section 6.2
The proposed sediment numeric target, 2.5 ug/kg, is based upon an outdated EPA seafood consumption model. The sediment numeric target is based on generic bioaccumulation factors and is not specific to SF Bay. There has been no verification of the BSAF to fish tissue.

There is no evidence presented linking the SF Bay ambient concentrations of 22-35 ppb to the PCB concentrations in fish tissue. Additionally this is a generic screening level from USEPA for waterbodies nationwide.

Section 7 Relationship between fish tissue PCB concentration and sediment and water PCB concentrations is not well understood but is a very important part of the argument for the numeric targets. There needs to be more study in order to set a level. We recommend a tired approach of first obtaining the data, with data to be considered including bioaccumulation studies from cleanup sites in Bay; then independent verification studies; and finally, requesting compliance.

Section 7.3 If the emphasis is to reduce external PCB loads to the Bay, Maintenance dredging activity is not a net gain in the bass balance of PCBs. In addition maintenance dredging typically occurs in the "active layer" not the "bedded sediment".

<u>TMDL Implementation</u>
Section 8 (pg 54)
Hot Spots are not considered in the quantification of PCB loads; however they are a source which requires consideration.

Vague language such as in Section 8.2 "attainment of sediment target will take a long time (SFEI, 2002c) should be revised.

If you have any questions or comments, please feel free to contact me at 925.274.1100.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Diane K. Mims
Associate

cc: File

CALIFORNIA CHAMBER of COMMERCE

February 20, 2004

VIA HAND-DELIVERY
Mr. Tom Mumley
Section Leader, TMDL Section
California Regional Water Quality Control Board
San Francisco Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: Public Comment on RWQCB's January 8, 2004 Project Report for a TMDL for PCBs in San Francisco Bay

Dear Mr. Mumley:

The California Chamber of Commerce (the "Chamber") and its member, the General Electric Company, hereby are submitting to the California Regional Water Control Board, San Francisco Bay Region, the enclosed comments on the agency's report dated January 8, 2004 entitled, "PCBs in San Francisco Bay Total Maximum Daily Load Project Report" (hereinafter the "Project Report"). The Project Report presents the recommendations of the agency's staff "pertaining to establishing a total maximum daily load (TMDL) and implementation plan" for PCBs in San Francisco Bay.

We appreciate the opportunity to submit these comments on the Project Report to the agency. The Chamber and its members including General Electric have a particular interest in this matter, as we believe the proposed TMDL has critical technical problems and will result in inappropriate actions that may be technically infeasible, and may likely do more harm than good, and also because, as an association representing business interests in the State and General Electric as a company with such business interests, we are concerned the proposed TMDL will precipitate undue economic impacts on the business community, without commensurate environmental benefit, and will foster a climate unfavorable to the growth and competitiveness of the California economy, and to Bay-area businesses.

We are available to discuss our comments with the agency at the agency's convenience and look forward to continued constructive participation in this matter.

Very truly yours,

Valerie Nera

Valerie Nera, Director
Agriculture and Resources, Water & Privacy

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[Note: The full version of these comments, including all attachments, is available at Regional Board headquarters. Please contact Laura Speare at ls@rb2.swrcb.ca.gov or 510-622-2452.]

COMMENTS ON CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD'S

TOTAL MAXIMUM DAILY LOAD PROJECT REPORT FOR PCBs IN SAN FRANCISCO BAY

Submitted by: Date: February 20, 2004

LATHAM & WATKINS LLP
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Costa Mesa, California 92626
Tel: (714) 540-1235
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Paul N. Singarella, Esq.
Patricia Guerrero, Esq.

On behalf of the California Chamber of Commerce (the "Chamber") and General Electric Company, we appreciate the opportunity to submit public comment to the California Regional Water Quality Control Board, San Francisco Bay Region ("RWQCB" or "Board"), in response to the Board's letter dated January 8, 2004 announcing the release of a report describing a proposed Total Maximum Daily Load ("TMDL") for PCBs in San Francisco Bay ("SFB" or the "Bay"), and requesting public comments on the report.[1] The Chamber and its members including General Electric have a particular interest in this matter, as we believe the proposed TMDL has critical technical problems and will result in inappropriate actions that may be technically infeasible, and may likely do more harm than good, and also because, as an association representing business interests in the State and General Electric as a company with such business interests, we are concerned the proposed TMDL will precipitate undue economic impacts on the business community, without commensurate environmental benefit, and will foster a climate unfavorable to the growth and competitiveness of the California economy, and to Bay-area businesses.

I.

SUMMARY OF COMMENTS

We are providing these comments because, on the basis of incomplete and incorrect science, the agency has materially overstated the persistence of PCBs in SFB and the risks they present, and, on the basis of that overstatement, is proposing what appears to be dramatic action to reduce the mass of PCBs in sediment "hot spots" throughout SFB and PCBs in urban runoff, each of which entails significant short-term implementation risks, as a means to reduce speculative long-term risk created by a false conclusion that the Bay is unable to recover naturally from current levels of PCBs. Full implementation of the proposed TMDL necessarily will result in extraordinary expense, but will not result in proportional risk reduction or environmental benefit. In addition, the agency has not articulated any practicable or technically feasible engineering means to achieve very stringent load reductions for urban runoff or the extremely low sediment target for PCBs in sediments, which target is well below background levels of PCBs throughout the entire SFB region and well below most "leave-behind" residual levels of PCBs typically found acceptable by the United States Environmental Protection Agency ("U.S. EPA") at other locations throughout the country. The agency's sediment and fish targets are borrowed from U.S. EPA national guidance, without any adjustment for conditions in SFB, and are being used in a manner inconsistent with the purposes for which they were intended. The Food and Drug Administration's safe level for PCBs in fish is about 100 times higher than the agency's proposed fish target. The agency is not following the requisite administrative procedures designed to protect the interest of the public, as exemplified by the agency's apparent decision to not subject this TMDL to a review of economic and business impact pursuant to Governor Schwarzenegger's Executive Order S-2-03. It is of the utmost importance to put the

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[1] These comments are based on RWQCB's public review draft entitled, "PCBs in San Francisco Bay Total Maximum Daily Load Project Report" (hereinafter "Project Report"), and other information which the agency furnished. We respectfully request that these public comments be given appropriate consideration, be placed in the administrative record, and be maintained in the agency's records.

TMDL through a thorough review of economic and environmental consequences, because the agency's proposed plans for mass removal of PCBs from sediments and reduction of PCBs from runoff likely will entail large-scale dredging, the use of diesel-emitting heavy equipment, and the construction of treatment facilities. The sediment target is so low that it likely will impede and interfere with maintenance dredging of ports and harbors, waterfront redevelopment, and even habitat restoration and the construction of artificial wetlands. These impacts, and the direct costs of meeting the TMDL, will result in economic dislocation, and the possible loss of jobs, further eroding the Bay Area's competitiveness.

The marginal long-term benefits of the proposed TMDL do not warrant the short-term risks, the potentially adverse consequences, and the economic impact. RWQCB proposes to reduce PCB levels in SFB fish to 22 parts per billion ("ppb"), and proposes a sediment target of 2.5 ppb. The proposed sediment target of 2.5 ppb is two to ten times below the lowest PCB concentrations throughout the entire Bay. Such a target has far-reaching potential adverse consequences, potentially making it more difficult and expensive to manage sediment in SFB, whether that entails removing it from places where it impedes navigation and the commerce at our ports, or utilizing it as a resource for habitat restoration or the construction of wetlands. The TMDL may affect adversely, and increase the cost of, projects to restore or reclaim habitat, or construct wetlands, given that such projects typically rely on the availability of sediment that can be used as a resource. The TMDL may adversely affect maintenance dredging and the ability to keep the region's ports open for business, and the costs of, and options for, disposal of dredged material. The TMDL may adversely affect waterfront development and redevelopment, since such economic activity is certain to encounter sediment with levels greater than 2.5 ppb. Mass removal of sediment from so-called "hot spots" likely will result in adverse impacts, as equipment to remove the material likely will generate diesel exhaust, and the act of sediment removal likely will reintroduce PCBs otherwise sequestered in the sediment into the water column.

Identification and characterization of potentially adverse environmental impacts such as those outlined above is the fundamental purpose of the California Environmental Quality Act ("CEQA"), and must be undertaken before RWQCB can select a preferred alternative or proceed to implement its TMDL. RWQCB recently described its proposed PCB TMDL as the "culmination of years of work." However, it was not until February 10, 2004 that RWQCB kicked off the legally required process under CEQA to analyze alternatives to the agency's proposed course of action and the potential adverse impacts associated with its proposal and the alternatives. RWQCB started the CEQA process long after it apparently selected its preferred TMDL approach -- namely, sediment targets and a focus on sediment cleanup and "hot spot" removal. It violates CEQA to begin CEQA proceedings only after a lead agency has preordained an outcome, as appears to be the case here with the agency's inflexible focus on sediment PCBs over other sources and alternatives. RWQCB needs to identify a range of reasonable alternatives and put them on an equal footing with its proposed alternative, and evaluate them through a legitimate and comprehensive CEQA process, before deciding on a TMDL.

The agencies present implementation plan, although very vague, appears unworkable and impracticable. The TMDL materially overstates the actual need to clean up sediment "hot spots." Without ever quantifying a TMDL allocation for sediments, or any reduction in risk for cleaning up "hot spots," RWQCB concludes that cleaning up the "hot spots"

should "form the core of the TMDL implementation strategy." However, a sound analysis of the actual data and dynamics of the Bay indicates that remediating sediment "hot spots" would have little impact on PCB levels in fish as the "hot spots" are not a major source of PCBs to the Bay; nor are they a major source of any risk from eating fish from SFB.

We offer these comments only after having consulted with numerous recognized experts whose original work product, prepared in order to assist the agency, is included herewith. Analysis by these experts indicates that significant, well-documented natural recovery of SFB will continue, reducing PCB levels over the next twenty years to well below acceptable levels without the potentially extreme measures contemplated in the Project Report. RWQCB dismisses empirical evidence of natural recovery and instead relies on a computer model that ignores tidal flushing of SFB -- a process that is a principal component of the ongoing natural recovery of SFB. RWQCB's model assumes that SFB -- one of the most famous estuaries in the world -- behaves like a lake which is not subject to tidal influences. Correction of this key error will lead RWQCB to fundamentally different conclusions, and a fundamentally different TMDL.

The presence of ongoing natural recovery demonstrates that RWQCB has the benefit of time on its side, and should take the time to correct the TMDL. However, RWQCB's apparent haste to do something -- a false urgency created by a misunderstanding of SFB dynamics -- has lead the agency to propose scientifically and legally indefensible numeric targets that RWQCB evidently picked without technical support and in reliance on vague narrative criteria. RWQCB has proposed these targets despite conceded scientific uncertainty on a variety of issues and without a calculation method to support them. In addition, the proposed targets would preempt an ongoing State Water Resources Control Board ("SWRCB") process whereby SWRCB, under exclusive statutory authority, is developing sediment quality objectives for the State of California, including SFB. RWQCB should not be setting objectives for which its authority is suspect, especially in the absence of the regulatory protocols being developed by SWRCB.

Although the agency has been working on this TMDL for some time, this is the first time the agency has asked for public comment on staff's official recommendations, including the proposed numerical PCB targets of the TMDL, the proposed PCB reductions to be called for, and the proposed implementation strategy. In addition, the agency only initiated environmental review of the TMDL on February 10, 2004. Thus, while the agency may have a long history already invested in the TMDL, the public at large is only now seeing the agency's policy proposals, and the environmental review of these proposals has just begun. Unfortunately, what already is clear is that the proposed TMDL raises more questions than it answers, and could have far-reaching unintended, adverse consequences for the SFB region. Given the numerous unanswered questions and conceded uncertainties, errors in the work upon which RWQCB is relying and the absence of any clear impairment, the prudent course is for RWQCB to await additional evidence and proper methods for interpreting narrative criteria and determining what measures are needed to attain applicable water quality standards. RWQCB carefully should consider all scientifically supportable data and information, and conduct further studies to obtain any missing information, rather than forging ahead on the basis of "policy" choices based on inadequate data and faulty analyses.

II.

REGULATORY FRAMEWORK

A. Section 303(d) Listing Requirements

Under Section 303(d) of the federal Clean Water Act and applicable U.S. EPA regulations, states are required to identify waterbodies which are not meeting applicable water quality standards (i.e., "water quality objectives" under state law) despite the application of technology-based effluent limitations.[2]

Such waters are referred to as "water quality limited segments,"[3] or more commonly, as "impaired waters." The 303(d) submittal must include a description of the pollutants causing the excursion of water quality standards, a priority ranking of the water quality limited segments, "taking into account the severity of the pollution and the uses to be made of such waters,"[4] and a detailed description of the state's methodology.[5]

Federal regulations specify that states must "evaluate all existing and readily available water quality-related data and information" when developing the 303(d) List.[6] This requirement is designed to provide interested parties and the public-at-large the opportunity to participate in the 303(d) process and suggest changes to a state's methodology or conclusions.

U.S. EPA must either approve the submitted 303(d) List, in whole or in part, or establish the state's 303(d) List on its own.[7]

B. TMDL Development

States are required to determine the amount of each pollutant for which the waterbody is listed that may be discharged without exceeding water quality standards in the waterbody.[8] This value is referred to as a Total Maximum Daily Load, or "TMDL,"[9] and reflects the ability of a waterbody to assimilate pollutant loading.

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2 33 U.S.C. § 1313(d)(1)(A); 40 C.F.R. § 130.7.

3 40 C.F.R. § 130.2(j).

4 33 U.S.C. § 1313(d)(1)(A).

5 40 C.F.R. § 130.7(b).

6 Id. at § 130.7(b)(5).

7 Id. at § 130.7(d).

8 33 U.S.C. § 1313(d)(1)(C); 40 C.F.R. § 130.7(c)(1). See also 40 C.F.R. § 130.2(i).

9 40 C.F.R. § 130.7(c).

The TMDL and associated load allocations must be set at levels necessary to result in attainment of applicable water quality standards,[10] "taking into account critical conditions for stream flow, loading, and water quality parameters."[11] The permissible load is allocated by the state agency among specific sources through the implementation of water quality-based effluent limitations.[12]

U.S. EPA has identified several factors that bear on a state's allocation of available assimilative or loading capacity, including "technical and engineering feasibility; cost or relative cost; economic impacts/benefits; cost effectiveness; fairness/equity; ability to monitor implementation and effectiveness; assurance and timeliness of attainment of the TMDL and water quality standards; relative source contributions; and/or other appropriate criteria."[13]

Where point sources receive less stringent allocations because nonpoint source reductions are specified in the TMDL, the TMDL must include a demonstration that nonpoint source loading reductions are practicable, technically feasible and reasonably assured of being implemented in a reasonable period of time.[14] This demonstration provides "[r]easonable assurances" that "the measures identified will actually obtain the predicted reductions and that the State is able to assure this result."[15]

TMDLs must be incorporated into the state's water quality control plans, which in California requires that TMDLs be incorporated into RWQCB Basin Plans.[16] State law requires that TMDLs include implementation plans containing, but not be limited to, the following

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10 33 U.S.C. § 303(d)(1)(C). The allocations are of two types: wasteload allocations ("WLAs") among contributing point sources, and load allocations ("LAs") for nonpoint sources.

11 40 C.F.R. § 130.7(c).

12 Id.

13 Guidance for Developing TMDLs in California, EPA Region 9 (January 7, 2000) at 4.

14 Id. at 10.

15 Id. See also Guidance for Water Quality Based Decisions: The TMDL Process, Pub. No. 440/4-91-001 (U.S. EPA 1991) at Chapter 2 ("In order to allocate loads among both nonpoint and point sources, there must be reasonable assurances that nonpoint source reduction will in fact be achieved. Where there are not reasonable assurances, under the CWA, the entire load reduction must be assigned to point sources.").

16 Both the TMDL process itself and the basin planning process constitute agency rulemaking. See, e.g., State Water Resources Control Board v. Office of Administrative Law, 12 Cal. App. 4th 697, 701 (1993) (basin plans are regulations); Asarco Inc., et al. v. State of Idaho, et al., Case No. CV-00-05760 (D.C. Idaho 2001) at 21 (holding that "the establishment of the TMDL involved 'rulemaking'" and "required that Idaho follow the requirements for 'rulemaking' set forth in the Idaho APA"). Because the TMDL process itself constitutes agency rulemaking, RWQCB cannot artificially segregate this process from the basin planning process; RWQCB was required to comply with the rulemaking requirements when it began the TMDL process.

elements: (1) "[a] description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private"; (2) "[a] time schedule for the actions to be taken"; and (3) "[a] description of surveillance to be undertaken to determine compliance with objectives."[17] A TMDL and its implementation plan form the basis for RWQCB actions to manage impaired waterbodies.

C. California Porter-Cologne Water Quality Control Act

The California Porter-Cologne Water Quality Control Act establishes the framework pursuant to which RWQCBs reasonably protect water quality in California.[18] Pursuant to the Porter-Cologne Act, each of the Regional Boards is responsible for adopting a water quality control plan, known as a Basin Plan.[19] A Basin Plan includes three elements: (1) beneficial use designations, (2) water quality objectives to protect those uses, and (3) a program of implementation to achieve water quality objectives.[20]

1. Beneficial Uses

The beneficial uses for SFB cited to in the Project Report relate to commercial (including recreational fishing), estuarine and wildlife uses of SFB.[21]

2. Water Quality Objectives

Water quality objectives can take the form of specific, numeric objectives or descriptive narrative objectives. Of relevance to this action is the Basin Plan's narrative standard for bioaccumulative toxic substances, which states that "[m]any pollutants accumulate on particles, in sediment, or bioaccumulate in fish and other aquatic organisms."[22] Accordingly, RWQCB has concluded that "*[c]ontrollable water quality factors* shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life," and that "[e]ffects on aquatic organism, wildlife, and human health will be considered" in determining whether this narrative standard is met.[23] "Controllable water quality factors" are defined as "those actions, conditions, or circumstances resulting from human activities that may

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17 Cal. Water Code § 13242.

18 Cal. Water Code §§ 13000 et seq.

19 See Cal. Water Code §§ 13240-13247.

20 Cal. Water Code § 13050(j). Federal law requires states to establish water quality standards such as those set forth in the Regional Board's Basin Plan. See 40 C.F.R. §§ 130.10 and 130.11.

21 Commercial ("COMM") beneficial use is defined as "[u]ses of water for commercial or recreational collection of fish, shellfish, or other organisms in oceans, bays, and estuaries, including, but not limited to, uses involving organisms intended for human consumption or bait purposes." Basin Plan at 2-2.

22 Basin Plan at 3-2.

23 Id. (emphasis added).

influence the quality of the waters of the state and that may be *reasonably controlled*."[24] This emphasis on regulating only those factors that are reasonably controllable is consistent with the Basin Plan's overall theme that excursions of narrative standards must be demonstrated through the observation of actual impact. As explained in a 1998 RWQCB Staff Report:

> The 1995 Basin Plan addresses toxic chemicals by stating that waters shall be "free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms" (Toxicity Narrative Standard page 304). In other words, it is presumed that there can, and usually will be, potentially toxic chemicals detected at some concentrations. However, one must observe a toxic effect to consider this a failure of the standard.[25]

3. Implementation Plans

When developing water quality objectives and a program of implementation for achieving those standards, RWQCB must account for the fact that water quality can be changed without unreasonably affecting beneficial uses.[26] RWQCB is required to engage in a balancing process when determining what water quality objectives and implementation plans are necessary and appropriate, taking into consideration a variety of factors including economic considerations.[27]

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24 Basin Plan at 3-1 (emphasis added).

25 Staff Report, Ambient Concentrations of Toxic Chemicals in San Francisco Bay Sediments (May 1998) at 4.

26 See Cal. Water Code § 13241 provides ("it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses").

27 Water Code Section 13241 requires water quality objectives to satisfy statutorily enumerated factors. "Factors to be considered by a regional board in establishing water quality objectives shall include, but not necessarily be limited to, all of the following: (a) Past, present, and probable future beneficial uses of water. (b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto. (c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area. (d) Economic considerations. (e) The need for developing housing within the region. (f) The need to develop and use recycled water." Cal. Water Code § 13241. See also Cal. Water Code § 13240 (requiring RWQCB to conform to the policies of Section 13000 in connection with its Basin Plan); id. § 13000 ("[A]ctivities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality *which is reasonable*, *considering all demands* being made and to be made on those waters and the total values involved, *beneficial and detrimental, economic and social, tangible and intangible*.") (emphasis added).

SWRCB expressly has acknowledged that RWQCB "is under an affirmative duty to consider economics in connection with its basin planning process."[28] The Board "should review any available information on receiving water and effluent quality to determine whether the proposed objective is currently being attained or can be attained."[29] "If the proposed objective is not currently attainable, RWQCB should identify the methods which are presently available for complying with the objective."[30] Finally, RWQCB "should consider any available information on the costs associated with the treatment technologies or other methods which have been identified for complying with a proposed objective."[31] "If the economic consequences of adoption of a proposed water quality objective are potentially significant, RWQCB must articulate why adoption of the objective is necessary to ensure reasonable protection of beneficial uses."[32]

D. CEQA Applies To TMDLs Proposed By RWQCB

As discussed in our letter dated February 9, 2004, submitted to RWQCB as part of the Public Workshop and CEQA Scoping Meeting for the adoption of the PCB TMDL, CEQA[33] applies to RWQCB's development of the TMDL and proposed incorporation of it into the Basin Plan. Discussing the application of CEQA to TMDLs, SWRCB has acknowledged that "numeric targets and load allocations would probably fall into the category of performance standards."[34] Thus, per SWRCB, "the Regional Water Board must identify the reasonably foreseeable methods of compliance with the wasteload and load allocations and consider economic factors for those methods."[35] Treatment requirements like those implicit in the proposed TMDL also are subject to scrutiny as performance standards.

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28 Exhibit 1 (Memorandum from William R. Attwater, Chief Counsel, State Water Resources Control Board, to Regional Water Board Executive Officers, dated January 4, 1994) ("1994 State Board Memo") at 4.

29 Id.

30 Id.

31 Id.

32 Id. at 5. See also Exhibit 2 (Memorandum from Sheila K. Vassey, Senior Staff Counsel Office of Chief Counsel, to TMDL Coordinator (October 27, 1999) ("The Boards must consider economics in establishing water quality objectives that ensure the reasonable protection of beneficial uses.").

33 Cal. Pub. Res. Code §§ 21000 et seq.

34 Exhibit 3 (Memorandum from William R. Attwater, Chief Counsel, Office of Chief Counsel of SWRCB, to Executive Officer of Santa Ana Regional Water Quality Control Board, "Do TMDLs Have to Include Implementation Plans?" (March 1, 1999)) at 7.

35 See, e.g., Exhibit 2 (Memorandum from Sheila K. Vassey, Senior Staff Counsel Office of Chief Counsel, to TMDL Coordinator (October 27, 1999) at 27 ("TMDLs will typically include performance standards…."); Exhibit 3 (Memorandum from William R. Attwater, Chief Counsel, Office of Chief Counsel of SWRCB, to Executive Officer of Santa Ana

III.

AGENCY PROCEEDINGS

A. Relevant 303(d) Listing Proceedings

On November 3, 1998, U.S. EPA partially approved California's 1998 Section 303(d) List of impaired waterbodies.[36] On May 12, 1999, EPA transmitted the final Section 303(d) List for California.[37] San Francisco Bay is identified on the finalized 1998 Section 303(d) List as impaired for PCBs due to an "interim health advisory for fish."[38]

On June 5, 2003, EPA partially approved and partially disapproved of California's 2002 Section 303(d) List.[39] On July 25, 2003, EPA transmitted the final 2002 Section 303(d) List for California.[40] San Francisco Bay continues to be listed on California's Section 303(d) List as impaired due to the presence of a fish advisory warning anglers that fish in the Bay may pose a health concern when consumed in large quantities.[41]

B. RWQCB's TMDL For PCBs In San Francisco Bay

1. Development Of Numeric Sediment And Fish Targets

RWQCB repeatedly acknowledged the difficulties and uncertainties that prevented it from identifying numeric targets and developing a TMDL. In June 1999, RWQCB staff admitted that "[i]nsufficient data are currently available to establish a numeric target such as a Total Maximum Daily Load (TMDL) for PCBs."[42] In November 1999, RWQCB characterized the Board's insufficient "understanding of the physical dynamics of sediments in San Francisco Bay" as a "major data gap," and noted that there was "a great impetus to better [RWQCB's] understanding of this parameter" prior to developing a TMDL.[43]

Regional Water Quality Control Board, "Do TMDLs Have to Include Implementation Plans?" (March 1, 1999)) at 6-7 ("Under CEQA, the Regional Water Board would have to identify the reasonably foreseeable methods of compliance with any TMDL provisions that established performance standards or treatment requirements [under Section 21159].").

36 Letter from U.S. EPA, Region 9, to Walt Pettit, May 12, 1999.

37 Id.

38 1998 California 303(d) List and TMDL Priority Schedule, Region 2.

39 Letter from U.S. EPA, Region 9, to Celeste Cantu, July 25, 2003.

40 Id.

41 2002 CWA Section 303(d) List of Water Quality Limited Segment, San Francisco Bay Regional Water Quality Control Board.

42 San Francisco Bay--PCBs TMDL Workplan (Draft June 1999) at 1.

43 "PCB Data Gaps" from electronic files of Fred Hetzel, November 22, 1999.

On October 16, 2002, RWQCB staff issued a Staff Summary Report and made a presentation, formally initiating the regulatory proceeding to develop, adopt and implement a TMDL for SFB PCBs despite the significant acknowledged uncertainties.[44] The Staff Report set forth RWQCB's proposal to adopt a TMDL by "developing numeric targets for PCBs in fish tissue and sediment that will serve as the basis of the TMDL and load allocation scheme," which would "in turn set the stage for pollution control and remediation actions."[45] The staff's presentation identified sediment and fish targets for PCBs that are virtually the same as those proposed in the Project Report (2.5 and 23 ppb, respectively).

The Staff Report forecast that RWQCB would continue taking regulatory action to develop "an implementation strategy based on reducing loading of PCBs to the Bay via cleanup of 'hot spots' on storm drains and on lands that drain to them along with remedial actions for in-Bay sediments with elevated PCBs concentrations."[46]

On January 8, 2004, RWQCB "officially released" the Project Report despite these significant (and apparently still unresolved) uncertainties. Just as RWQCB staff had suggested in October 2002, the Project Report includes "numeric targets" for sediments (2.5 ppb) and fish tissue (22 ppb). As discussed in the technical comments below, the sediment and fish targets both were derived using screening values, generic assumptions and outdated input parameters rather than relevant and representative, site-specific data. RWQCB uses these targets to focus heavily on cleaning up PCB-containing sediments in SFB as a primary implementation strategy.[47]

While the Project Report acknowledges there are numerous uncertainties associated with the proposed TMDL,[48] RWQCB does not accurately convey the gravity and

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44 State of California Regional Water Quality Control Board, San Francisco Bay Region, Staff Summary Report (Fred Hetzel), meeting date October 16, 2002 (hereinafter "Staff Report"); Total Maximum Daily Loads for PCBs in San Francisco Bay, PowerPoint Presentation by Fred Hetzel.

45 Staff Report at 1.

46 Staff Report at 1.

47 See, e.g., Project Report at 54 ("We propose to further accelerate the natural recovery of the Bay by pursuing remediation of in-Bay PCBs contaminated sediments."); id. at 57 ("Modeling results show that attainment of the sediment target will take a long time…. However, 'hot spot' remediation will have a large effect on PCBs in localized biota and will help accelerate the natural recovery of the Bay. We expect that significant PCBs mass removal will take place at PCBs 'hot spots' based on site-specific clean-up plans."); id. at 62 ("Remediation of in-Bay contaminated sediments will likely accelerate the natural recovery of the Bay.").

48 See, e.g., Project Report at 13 ("Many physical and chemical factors affect this persistence and transfer, ultimately limiting [RWQCB's] ability to predict the fate and transport of PCBs in aquatic environments."); id. at 31 ("Potential contribution of PCBs to biota from these sediment 'hot spots' needs to be further evaluated…."); id. at 52 ("Our ability to predict recovery time for the Bay will be improved with the development

significance of the numerous data and information gaps underlying the TMDL. Documents produced by RWQCB pursuant to a Public Records Act request confirm RWQCB has been aware for quite some time that it has insufficient information to proceed with this TMDL.[49]

Instead of postponing its TMDL until sufficient evidence to proceed is obtained through additional investigation, RWQCB asserts that it has incorporated a "margin of safety" into its analyses.[50] No margin of safety, however, can lawfully correct for RWQCB's failure to develop and rely upon technically sound and reasonable targets.

2. TMDL Load Allocations And Implementation Program

RWQCB used a "mass budget" model to determine the TMDL it views as necessary to attain applicable water quality standards.[51] RWQCB used this model to look at the fate of PCBs in the Bay with various mass loading scenarios.[52] It then predicted the recovery curve of the Bay for PCBs under various loading scenarios. Figure 20 in the Project Report is a

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of a multi-box model of PCBs"); id. at 58 ("Load reductions from in-Bay hot spot removal is difficult to quantify, but will accelerate the recovery of the Bay and therefore the attainment of beneficial uses.").

49 See, e.g., San Francisco Bay--PCBs TMDL Workplan (Draft June 1999) at 1 ("*Insufficient data are currently available to establish a numeric target such as a Total Maximum Daily Load (TMDL) for PCBs*. Calculation of a total allowable load of PCBs so as to reduce concentrations in fish below fish advisory levels will require complex modeling and monitoring. Regulating sources is also a challenge because ongoing use of PCBs is no longer legal. While we believe that historical use and/or disposal may have created 'legacy sources' from which there may still be uncontrolled discharges of PCBs, identifying these sources will require a significant monitoring and data collection effort in and of itself.") (emphasis added); "PCB Data Gaps" from electronic files of Fred Hetzel (November 22, 1999) ("An understanding of the physical dynamics of sediments in San Francisco Bay seems to be needed for most TMDLs and other programs. There is a great impetus to better our understanding of this parameter. The results from EMAP/NOAA work and the proposed San Francisco Airport could be used to better this understanding. The relationship between physical sediment dynamics and bioturbation also needs to be evaluated. *This is a major data gap* that will require coordination by many agencies and may be outside the scope of current TMDL funding.") (emphasis added).

50 See Project Report at 57-58 ("[W]e are incorporating an implicit margin of safety…. We intend to regularly review the effectiveness of implementation actions in meeting the TMDL target, and revise, as necessary, the proposed the [sic] load and wasteload allocations. We also propose to continue monitoring of the TMDL target and to reevaluate the appropriateness of the currently proposed fish tissue target and sediment target.").

51 Project Report at 48.

52 Id. at 49.

graphical depiction of RWQCB's modeling results on the fate of PCBs in the Bay.[53] It purports to show the mass of PCBs in the Bay over 100 years based on different loading scenarios.

Starting with an assumption of 2500 kg PCBs in the surface layer at year zero, the model assumes that a load of 80 kg/year of PCBs will keep the Bay at a nearly constant state for the next 100 years (i.e., close to zero PCB reductions).[54] A PCB load of 80 kg/yr is in the same range as the total load estimated by RWQCB.[55] Thus, RWQCB is conveying to the public that something (i.e., cleaning up Bay sediments) must be done, or conditions will not improve for 100 years. RWQCB then suggests that if the load is halved to 40 kg/yr, the predicted PCB mass in the Bay is reduced in half in 60 years.[56] Finally, RWQCB states that if the loads are reduced to 20 kg/yr, the same 50% reduction in PCB mass will be accomplished in only 30 years (i.e., twice as fast as if the load were 40 kg/yr).[57] According to RWQCB, the mass budget model "predicts that even small PCBs loads to the Bay will delay the reduction of in-Bay PCBs."[58] RWQCB therefore highlights "the importance of reducing current external loads of PCBs to the Bay."[59] However, RWQCB does not stop there; the Board also calls for cleanup of sediment "hot spots."[60]

Based on the mass budget model results, RWQCB proposes a total PCB load of 31 kg/yr, to be allocated among all sources.[61] This requires achieving a load reduction of 53 kg/yr from current PCB loads.[62] RWQCB claims that its mass budget model predicts a reduction of PCBs in the active layer to about 350 kg in 100 years with this load reduction.[63] RWQCB asserts that "this is equivalent to attaining the sediment target, and therefore the fish tissue target," and "propose[s] to further accelerate the natural recovery of the Bay by pursuing remediation of in-Bay PCBs contaminated sediments."[64]

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53 Project Report at 51.

54 Id. at 50-51; Figure 20.

55 See Project Report at 54 (Table 27).

56 Id. at 50-51; Figure 20.

57 Id.

58 Id. at 50.

59 Id.

60 Id. ("Achieving these load reductions, along with cleanup of in-Bay sediment PCBs hot spots, will form the core of the TMDL implementation strategy.").

61 Project Report at 54 (Table 27).

62 Id.

63 Id. at 54, 51 (Figure 20).

64 Id. at 54.

In addition to focusing heavily on remediating contaminated sediments, RWQCB's TMDL requires a large load reduction (32 kg/yr) for urban runoff discharges.[65] Loads for in-Bay dredged material must be reduced by 11 kg/yr under the TMDL,[66] and PCB loads from the Delta must be reduced by 10 kg/yr.[67]

While RWQCB contends that these significant load reductions are needed in order to meet the targets it proposes, it takes a different position with respect to wastewater discharges. The water column is a source of PCBs for the fish that RWQCB is attempting to protect. The Project Report acknowledges that wastewater discharges contain material levels of PCBs,[68] yet RWQCB does not propose any reductions from this source. RWQCB should explain on what basis it has concluded that the PCBs in wastewater are not linked to the PCBs in fish, and therefore do not warrant load reductions.

IV.

TECHNICAL AND SCIENTIFIC COMMENTS

A number of experts with whom we have consulted independently analyzed the Project Report, the underlying assumptions made and methodologies used by RWQCB to support the conclusions it reached in the report, and the soundness and validity of those assumptions. These experts also considered the environmental and economic consequences of the proposed TMDL. The reports of these experts are attached hereto as Tabs B-G, and are incorporated in full by reference.[69]

A. Experts Consulted

QEA: Dr. John P. Connolly is a nationally recognized expert in coastal fate and transport processes and food web modeling. In 2000, he was qualified as an expert by a California federal District Court judge to opine on the fate and transport of PCBs off the coast of Southern California, including their movement through the food web. In that case, the white croaker was an important part of the food-chain analysis, just as RWQCB alleges in the PCB TMDL for SFB. In that case, Dr. Connolly was retained by the State of California, including the resource trustees for the white croaker. Dr. Connolly has been an expert witness on numerous other occasions, including in 2001 when he provided expert testimony before the Subcommittee on Water Resources and Environment of the U.S. House of Representatives regarding the approaches used by U.S. EPA to address contaminated sediments. Dr. Connolly received his

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65 Id. at 56.

66 Id. at 54, 57.

67 Id. at 54, 56.

68 Project Report at 35 ("Wastewaters from the POTWs with secondary treatment have an average PCBs concentration of 3,600 pg/L….").

69 Although we have summarized some of the expert statements in these comments, we respectfully request that all the expert reports be given independent consideration, be placed in the administrative record, and be maintained in the agency's files.

Ph.D. in civil engineering with a focus on environmental engineering from the University of Texas in 1980 and presently is the President and Senior Managing Engineer of Quantitative Environmental Analysis, LLC ("QEA").

QEA: Dr. Jennifer Benaman received a Ph.D. in Civil and Environmental Engineering from Cornell University in 2003. Dr. Benaman is currently a Project Manager with QEA, where she has been employed since 1998. Prior to that, Dr. Benaman performed environmental modeling and data analysis at HydroQual, Inc. A primary focus of Dr. Benaman's recent work is TMDLs, their development, implementation, and impact.

BBL: Dr. Kenneth D. Jenkins received a Ph.D. in biology from the University of California, Los Angeles, in 1970. Dr. Jenkins served as a Professor of Biology at California State University at Long Beach from 1970 to 1997 and is now a Professor Emeritus. Dr. Jenkins has over 30 years of experience in the field of environmental toxicology. He has expertise in contaminant fate and transport, contaminant bioavailability, and contaminant metabolism and mechanisms of toxicity. Dr. Jenkins has served on numerous panels and task forces and has given testimony before Congress. He has authored over 100 scientific papers, book chapters, and technical reports. Dr. Jenkins presently is a Senior Vice President/Principal Toxicologist with Blasland, Bouck & Lee, Inc. ("BBL").

BBL: Ms. Bridgette R. DeShields received an M.S. in Environmental Management from the University of San Francisco in 1998. Ms. DeShields has been in the field of site investigation environmental toxicology for more than 18 years, specializing in ecological and human health risk assessment and aquatic toxicology; project management; research and testing in the areas of aquatic bioassays, sediment and soil toxicity evaluations, water and air quality monitoring, behavioral biology, and risk assessment; developing site-specific water-quality criteria; managing field studies; developing work plans, quality assurance/quality control plans; and data quality objectives, dealing with local California and federal regulatory agencies.

TER: Ms. Kristy Mathews received an M.A. in economics from The George Washington University in 1989. From 2002 to date, Ms. Mathews has served as Vice President of Triangle Economic Research ("TER"), where she has been employed since 1994. Ms. Mathews specializes in the areas of human health exposure assessment, natural resource damage assessment, nonmarket valuation, survey design and administration and economic impact analysis.

TER: Dr. William H. Desvousges received a Ph.D. in economics from Florida State University in 1977. From 1994 to date, Dr. Desvousges has served as President of TER. During that time, Dr. Desvousges also has served as a Research Professor at Duke University. Dr. Desvousges has significant experience lecturing and teaching economics at various institutions, including the University of Missouri (1975-1980), Meredith College (1986), University of North Carolina (1984-1985), and North Carolina State University (1980-1984). Dr. Desvousges' areas of specialization include natural resource damage assessment, benefit/cost analysis, survey design and management, environmental costing, and health economics.

WSI: Dr. Margaret M. Lobnitz received a Ph.D. in Environmental Science and Engineering from the University of California, Los Angeles, in 1983. Dr. Lobnitz has over

20 years of experience in the management of environmental assessment programs in California. She is currently a Vice President at Weston Solutions, Inc. ("WSI"), where she specializes in regulatory compliance, air pollution control, and CEQA and NEPA impact analysis. Dr. Lobnitz has provided technical support in the preparation of numerous environmental impact documents, with a recent focus on air, sediment, wetland, and endangered species impacts.

B. Technical Comments

The experts listed above have identified numerous technical deficiencies and errors in RWQCB's analyses that have caused the agency to inaccurately portray the persistence of PCBs in SFB and potential risks associated with them. The Board ignores multiple lines of empirical evidence of natural recovery, and instead relies on a one-box model that provides inaccurate predictions of natural recovery and the response of SFB to loading changes. An accurate assessment of natural recovery in SFB is essential to the correct development and implementation of the TMDL. Here, RWQCB focuses on so-called "hot-spot" remediation as an implementation tool, which the evidence shows will yield minimal benefits. Before RWQCB can develop and implement a feasible and effective plan to reduce PCBs in SFB, it must first address all of these technical defects, and others, discussed in this section (and in the expert reports, Tabs B-G).

1. RWQCB Dismisses Ongoing Natural Recovery In SFB

Throughout much of the Project Report, RWQCB correctly acknowledges that natural recovery is occurring in SFB, resulting in declining levels of PCBs in the Bay as shown in Mussel Watch data cited in the report.[70] The mussel data consist of a 20-year record of PCB levels in mussels collected from multiple sites within the Bay showing consistent declines. This decreasing trend is reflected in Table 10 of the Project Report, which shows decreasing PCB concentrations in deployed bivalves in SFB from 1993 to 1998.[71]

Although RWQCB acknowledges this information, it dismisses the data in favor of its flawed one-box model, stating that "[i]nterpretation of bivalve data is limited . . . due to changing analytical procedures over time."[72] This dismissal is unwarranted. The cited analytical changes cannot explain the magnitude and the consistency of the declines, and do not invalidate the decreasing trend analysis. As Dr. Connolly and Dr. Benaman explain:

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70 See, e.g., Project Report at 19 ("Over time, the frequency of deployed bivalves with tissue PCBs concentrations less than the screening level of 70 nanograms per gram (ng/g) dry-weight . . . has increased . . . , indicating potential improvement of the Bay relative to PCBs."); id. at 25 ("There has been a decrease in bivalve PCBs concentrations in the last decade.").

71 Project Report at 20.

72 Project Report at 19; id. at 50 ("[D]uring the course of mussel tissue monitoring, there were changes in the analysis without recalibration of the results adding uncertainty to the observed temporal trend.").

> [T]he [State Mussel Watch] and [Regional Monitoring Program] data independently show similar rates of decline, and there does not appear to be a break, or jump, in concentrations moving from one program to the other…. Thus, this combined data set provides a reasonable measure of natural recovery in the Bay; it is likely that the changes in analytical methods between these programs had only a limited impact on the data, and that the true rates of decline are probably similar to the observed rates of decline.[73]

There also is strong independent scientific support for the decreasing trends observed in SFB. The downward trend is documented in peer-reviewed journal articles cited in the Project Report. There are several other lines of evidence available that RWQCB should use to evaluate natural recovery in a weight-of-the-evidence approach. In addition to the Mussel Watch data -- which show steadily decreasing declines in PCB levels -- PCB measurements in water, sediments and fish should be used to determine whether and to what extent natural recovery is ongoing. Drs. Connolly and Benaman reached the following conclusions based on a weight-of-the-evidence approach:

- PCB concentrations in the Bay have declined, and there are similar rates of decline in the Northern, Central and Southern regions of the Bay (i.e., half-lives ranging from 6 to 10 years, with an average of 8 years). Similar rates of decline in the 1980s and 1990s indicate that natural recovery does "not appear to be leveling off," but rather "is going as strong now as in the past."[74]

- Water column measurements of PCB concentrations for stations in the North, Central, and South Bay, all demonstrate a decreasing temporal trend.[75]

- Sediment cores collected from San Leandro Bay, San Pablo Bay, and Richardson Bay "all support the conclusion that recovery is ongoing."[76]

- Fish tissue data has shown a decreasing long-term trend since the 1950s. That no inferences regarding the health of the Bay can be drawn from the recent fish tissue data (i.e., mid-1990's) is due to the lack of sufficient fish tissue data to support a short-term trends analysis.[77]

Based on this evidence, Drs. Connolly and Benaman conclude that the "weight of evidence indicates strongly that PCB levels within San Francisco Bay are recovering with half-

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73 Tab B (QEA Expert Report) at 6.

74 Id.

75 Id., Figure 3.

76 Id. at 9.

77 Id. at 9, 14.

lives of between 6 and 10 years; that recovery is occurring in the southern, central and northern regions of the Bay; and that the rate of recovery does not appear to be slowing."[78]

This evidence demonstrates that PCBs are gradually dissipating through natural processes. Such a pattern is consistent with trends observed elsewhere in the U.S., as one would expect, given that PCB manufacture has been banned for over 25 years.

2. The One-Box Model Used In The TMDL Provides Inaccurate Predictions Of Natural Recovery And SFB's Response To Different Loading Conditions

Assuming a PCBs mass of 2500 kg/yr, RWQCB's model predicts that PCBs mass loads of 80 kg/yr "will result in a nearly constant mass of PCBs in the active layer for the next 100 years."[79] RWQCB never addresses the fact that predictions based on the model are inconsistent with earlier statements regarding the significant acknowledged ongoing natural recovery of the Bay. Instead, RWQCB ignores the previously cited empirical evidence in favor of a flawed model.

The mass budget model used by RWQCB to ascertain current PCB loads and proposed load reductions assumes that SFB is a lake, rather than accounting for the significant effects of ocean tides on PCB levels. Dr. John Connolly's initial report pointing out this error was submitted to RWQCB on April 25, 2003, but apparently ignored.[80] Ocean water reduces the mass of PCBs in the Bay by carrying some portion of it out to sea on each ebb tide. Thus, levels of PCBs in the Bay will continue to decline, due to the natural recovery presently occurring, even if current external PCB loads of 80 kg/yr persist.

Dr. Connolly and Dr. Benaman have again reviewed the one-box model in the Project Report and have concluded that RWQCB's "current one-box model can not reconcile the best estimate of the external loading (80 kg/yr) and the trend in the mussels data because of an inaccuracy of the model, which is the exclusion of tides."[81] Tidal exchange is a "key mechanism" that is missing from RWQCB's model.[82] Although RWQCB's model includes freshwater flow through the system, it does not include "new" ocean water that enters the system per tidal inflow, estimated to be almost four times larger than the average freshwater inflow rate.[83] This tidal inflow water contains PCBs at the level of ambient ocean water. "Upon entering the Bay, this new ocean water picks up additional PCBs and subsequently acts as a sink

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78 Id. at 16.

79 Project Report at 50.

80 This report is submitted as an attachment to Dr. Connolly's comments on the current Project Report.

81 Tab B (QEA Expert Report) at 16. "The model can only replicate the mussel trend if the loading is reduced to about 20 kg/yr." Id.

82 Id. at 17.

83 Id.

of PCBs when it exits the system in ebb tide."[84] This new ocean water "has a dominant effect on PCB fate within the bay" and results in a reduction in PCB levels in SFB.[85]

When a term was added to the one-box model to account for tidal exchange, Drs. Connolly and Benaman obtained results that were representative of the system. Their results were consistent with the empirical evidence of a declining trend in PCBs. "The results indicate that the one-box model with tides 'continues' the mussel trend line, while the original one-box model from the TMDL indicates an abrupt halt to the historical trend. Given that the loading estimate (80 kg/yr) was developed independent of the model, [Drs. Connolly and Benaman] can conclude that the one-box model with tides is representative of the system, while the same model without tides is not representative of the system."[86]

3. Remediation Of Sediment "Hot Spots" Should Not Be A Primary Focus Of TMDL Implementation

The presumed effectiveness of "hot spot" remediation is predicated on the implicit belief that the so-called "hot spots" are a major external source of PCBs to the Bay. This assumption is not correct; "hot-spot" remediation will yield minimal benefits because of the relatively small PCB mass contained in the "hot spots."

Drs. Connolly and Benaman have concluded that the Project Report has failed to demonstrate that the locations identified as "PCBs Sediment Hot Spots in the Bay"[87] are important sources of PCBs to the Bay.[88] The maximum sediment PCB concentrations provided are actually buried PCBs found well below the active sediment layer.[89]

Where sufficient information existed to make a conclusive assessment, our experts used sediment PCB data to evaluate the mass of PCBs in the active layer to determine whether "hot spots" are a major external source of PCBs to the Bay, as the Project Report assumes. Drs. Connolly and Benaman concluded that it is unlikely that sediment "hot spots" contain sufficient PCB mass to limit the recovery of the Bay.[90] For example, the bioavailable sediments in San Leandro Bay contain about 12 kg of PCBs,[91] which amounts to merely 0.5% of the total 2,500 kg of bioavailable PCBs estimated by the Project Report for the entire Bay.[92] Our experts have concluded that the total PCB mass in San Leando Bay sediments clearly cannot

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84 Id.

85 Id.

86 Id. at 17-18.

87 Project Report at 31 (Table 15).

88 Tab B (QEA Expert Report) at 19.

89 Id.

90 Id.

91 Id.

92 Id.

keep the sediments of SFB contaminated or materially reduce the rate of ongoing natural recovery. Although not enough data currently exists to make this type of quantitative assessment for other areas of the Bay, our experts concluded it is unlikely that similar analyses would show that any of the other "hot spots" are an important source of PCBs to the Bay.[93]

Furthermore, any attempt to clean up the so-called "hot spots" would be undermined by recontamination from the main SFB. The "hot spots" are largely depositional areas that trap particulate matter that enters the Bay with each tidal cycle. Ambient PCB concentrations in suspended particles show that the PCB concentrations exceed the sediment target by as much as an order of magnitude or more. These particles would cause the "hot spots" to become recontaminated when they are deposited on the sediments. "Whereas the 'hot spots' have insufficient PCB mass to keep the Bay contaminated, the Bay has sufficient PCB mass to recontaminate any remediated 'hot spot'."[94]

Based on this evidence, Drs. Connolly and Benaman have determined, in their expert opinion, that (a) "The inclusion of 'hot spot' remediation in the implementation plan is inappropriate because no analysis was done to demonstrate the potential benefits of such remediation on PCB levels in the water and in fish."; (b) "The data indicate that 'hot spot' remediation will yield minimal benefits because of the relatively small PCB mass contained in the 'hot spots'."; and (c) "Recontamination will undercut the goals of 'hot spot' remediation."[95]

4. The Project Report Overstates The Importance Of Local Sediments As A Source Of PCBs In Fish

RWQCB asserts that "sediments may be a more important source of PCBs to biota than the water column" because "benthic organisms are the major source of prey food for the fish species of concern."[96] The potential benefits of "hot-spot" remediation are based in large part on the validity of this assertion.

Drs. Connolly and Benaman examined the importance of local sediments as a source of PCBs to fish using two lines of evidence: (1) spatial gradients in PCB concentrations, and (2) natural history information on fish diet and movement patterns. Both of these lines of evidence demonstrate that the RWQCB's "conceptual model linking fish to sediments is inaccurate."[97]

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93 See id. at 19 ("Although not enough data exist to make this assessment for other areas of the Bay, the small surface area represented by the in-Bay 'hot spots' suggests that it is unlikely that a similar analysis conducted for the other areas would indicate that any of these 'hot spots' could be an important source of PCBs to the Bay.").

94 Id. at 19.

95 Id. at 18-19.

96 Project Report at 26.

97 Tab B (QEA Expert Report) at 20.

Spatial gradients in PCB concentrations in the fish do not support a direct sediment linkage. Whereas sediment concentrations are three times lower in the North Bay than in the South Bay, fish concentrations are not significantly different in these locations. This finding is consistent with evidence concerning fish diets and movement patterns, which indicates that "food resources in the water column are of importance to the fish community."[98] This is significant because of the extensive circulation within the Bay.

Drs. Connolly and Benaman explained the significance of their findings, which again cast doubt on RWQCB's focus on remediating sediment "hot spots":

> PCBs within the water column likely originate from a wide area of the bay, and thus PCBs in fish, even those near sediment hot spots, likely come from a combination of local and bay-wide sources. This means that even if local sediment remediation produced a significant reduction in sediment PCB concentrations (an unlikely result because of recontamination) the benefits to the fish would likely be limited.[99]

Instead of emphasizing sediment "hot spots," RWQCB should properly account for the fact that the fish of concern are not full-time residents of "hot spots," but rather move around seeking prey and optimal temperature conditions, and therefore may not obtain a significant portion of their PCBs from sediment "hot spots."[100]

5. The Proposed Sediment Target Is Technically Deficient

Experts who have reviewed the Project Report have identified numerous problems with RWQCB's sediment target and the assumptions used to derive that target. The fundamental technical problem with the target is that it is not based on knowledge of the extent to which fish in SFB obtain PCBs from a food web connected to bottom sediments. The target assumes that fish derive all (or the vast majority) of their PCBs from sediment, but this assumption is not plausible.[101] RWQCB hopes to obtain a reliable answer to this critical issue from a food web model in development at the San Francisco Estuary Institute. However, the researcher working on that model already has concluded that it is *not possible* to determine the amount of PCBs fish may be getting from sediment versus the amount they are getting from the water. Because this allocation is indeterminate, RWQCB is not justified in concluding that fish are getting all of their PCBs from the sediments in the Bay.

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98 Id. at 23.

99 Id. at 25.

100 In fact, the Department of Fish and Game states that white croakers younger than a year old, along with the smaller fish, emigrate out of the Bay during winter. See www.delta.dfg.ca.gov/baydelta/monitoring/wc.asp.

101 See Tab B (QEA Expert Report) at 27.

There are other technical problems with the sediment target value. First, the target is based on a value developed and used by U.S. EPA as a survey tool.[102] The Board fails to mention that the U.S. EPA survey tool or reference value was developed to help identify where potential problems might exist, not as a regulatory criterion, site-specific clean-up standard, or remediation goal.

Second, RWQCB unreasonably relied on "worst-case" assumptions that make the sediment target overly conservative, even if all the fish PCBs did come from sediment, which they do not. For example, the PCB reference value was derived using a theoretical bioaccumulation potential (TBP) calculation, which is based on an outdated assessment that has since been updated with more realistic cancer potency factors.[103]

Third, RWQCB's proposed sediment target used generic default values for other parameters in the TBP equation -- sediment organic carbon content (1 percent), fish lipid content (3 percent) and the ratio between fish and sediment PCB concentrations (1.85). As was the case with respect to the cancer potency factor, RWQCB's implicit adoption of these default values from U.S. EPA's national screening survey results in an overly conservative numeric sediment target. The Board's implicit adoption of these generic default values is unjustified as there are sufficient data for SFB to derive site-specific values for all of these parameters.[104]

Finally, the proposed sediment target is extremely low compared with acceptable residual PCB levels that U.S. EPA and other agencies typically allow to remain on site after a cleanup is completed.[105]

6. The Proposed Fish Tissue Target Is Technically Deficient

a. RWQCB's use of screening values is not valid.

RWQCB developed the fish tissue target using an approach from U.S. EPA for developing screening values, or SVs, that includes the use of several highly conservative assumptions. Both the Office of Environmental Health Hazard Assessment ("OEHHA") and U.S. EPA advise against using screening values for fish consumption advisories. OEHHA states:

> SVs are not intended as levels at which consumption advisories should be issued but are useful as a guide to identify fish species and chemicals from a limited data set . . . for which more intensive sampling, analysis or health evaluation are to be recommended.[106]

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102 U.S. EPA 1997. See Project Report at 47; Tab B (QEA Expert Report) at 26.

103 Tab B (QEA Expert Report) at 25-26.

104 Id. at 26-27.

105 Id. at 26, Table 1.

106 Brodberg, R.K. and Pollock, G.A., 1999. *Prevalence of selected target chemical contaminants in sport fish from two California lakes: Public health designed screening*

U.S. EPA similarly recognizes that screening values are of limited utility, and merely serve "as an indication that more intensive site-specific monitoring and/or evaluation of human health risk should be conducted."[107]

Given the level of conservatism and uncertainty associated with the use of a generic approach, coupled with U.S. EPA and OEHHA statements against relying on screening values for purposes other than as a screening tool for further study, RWQCB should not use screening values to develop targets in the TMDL process. Instead, a comprehensive risk assessment that utilizes relevant and representative site-specific data should be used to set the fish tissue target.

b. The fish consumption rate assumed by RWQCB is biased upwards and not relevant to the TMDL.

RWQCB uses a fish consumption rate of 32 grams/day based upon a study by the San Francisco Estuary Institute ("SFEI"). In the SFEI study, anglers who fished at the more popular sites in SFB were interviewed regarding their estimated consumption of fish during four weeks prior to the interview. Out of the many thousands of anglers in the SFB region, the 32 grams/day value corresponds to the reported fish-eating habits of only 53 anglers, mostly men, whose fish eating is extreme compared with women, children, other subgroups, and even other men.[108] In fact, the vast majority (more than 70 percent) of anglers surveyed by SFEI reported eating no fish from SFB in the prior four weeks.[109] 32 grams/day far exceeds any reasonable estimate of the amount of fish from SFB that is consumed by the general population in the Bay area. It also far exceeds any reasonable measure of the local consumption of bottom-feeding fish -- the fish about which RWQCB appears most concerned.

Any fish target needs to be set on the basis of fish consumption rates that are relevant to the TMDL, which the SFEI study was not designed to provide. The nature of the study design and biases in the results make the 32 gram/day fish consumption rate unsuitable for purposes of the TMDL.

(i) The SFEI study does not provide any estimates of the amount of bottom-feeding fish consumed by SFB anglers.

The proposed fish target assumes that the fish obtain their PCBs from bottom sediment, by foraging on animals living in these sediments. Thus, the rate at which SFB-area people eat fish strongly tied to a bottom food chain would be highly relevant to the TMDL. SFEI made no effort to characterize or estimate this fish consumption rate. Rather, the 32 grams/day value is a value based on consumption of any fish, many of which do not forage on

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study. Office of Health and Hazard Assessment, Pesticide and Environmental Toxicology Section; June.

107 USEPA, 2000. *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, 3rd Ed*. Office of Water. EPA 823-B-00-007.

108 Tab E (Mathews Expert Report) at 2-3.

109 Id. at 3.

the bottom, like striped bass. The survey information does not allow any reasonable estimate of consumption of bottom-foraging fish.[110]

(ii) The SFEI survey contains acknowledged biases that may have inflated the 32 grams/day value.

Most anglers interviewed in the SFEI study were male. Because more men fish recreationally than do women, the portion of survey respondents who are men is greater in the SFEI study than the proportion of men in the general population.[111] Evidence shows that men have higher fish consumption rates than women and children.[112] Accordingly, the SFEI consumption rate overestimates that of the general population, as well as any subgroups of women or children.

The SFEI sampling protocol intentionally focused on popular sites. The more popular sites are likely to correspond to areas where fish are caught more frequently. There is empirical evidence that higher catch rates at popular sites likely correspond to higher consumption rates for anglers who fish at those sites.[113] As a result, the SFEI consumption rates likely overestimate the consumption rate of Bay area anglers, as well as the overall population. The fact that the number of sites sampled is only a small portion of all fishing sites in SFB, sampling without replacement, and length-of-stay bias further caution against relying on the SFEI study results.[114] The SFEI study authors acknowledge that these design characteristics may result in a consumption rate that is "biased upwards."[115]

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110 See Tab E (Mathews Expert Report) at 1, 4.

111 Specifically, 86% of respondents who ate fish from SFB were male. Of the 53 anglers who comprised the upper 5% of the consumption rate distribution, only 5 were women. Tab E (Mathews Expert Report) at 3.

112 Id. at 3.

113 Id. at 6.

114 Length-of-stay bias refers to the fact that interviewers are more likely to interview anglers that fish for longer periods of time than those that fish for shorter periods. Because anglers who fish longer are more likely to catch more fish, their consumption rates may be higher. Tab E (Mathews Expert Report) at 6. Sampling-without-replacement occurs when interviewers purposefully do not approach an angler who was previously interviewed. By excluding repeat anglers, the study does not have the ability to determine the degree to which the sampled responses are representative of the population of SFB anglers. Id.

115 See SFEI study at 80 (stating that the sampling-without-replacement design feature lessons the magnitude of the avidity bias correction and that the "adjusted consumption rate results may be biased upward"); id. ("unless corrected, as with avidity bias, this [length-of-stay] bias may result in consumption rates that are biased upwards").

Finally, the SFEI study elicited biased information regarding the portion of fish anglers eat, further invalidating the fish consumption rate relied upon by RWQCB.[116] Anglers were asked to estimate the portion size of fish that they eat "from anywhere," including "the Bay, other places, stores, restaurants."[117] The mention of restaurant meals and store-bought fish has the potential to introduce an upward bias in the resulting consumption rate estimates.[118] As the study authors conclude, "the [portion size] model influences consumption rate responses and introduce[s] a degree of bias in the results."[119]

RWQCB should not rely upon biased information, like the SFEI study, in setting a fish target. The fact that the study's biases tend to inflate the study's fish consumption rates indicates that reliance upon the study has resulted in an overly conservative fish target.

(iii) RWQCB picked an unrepresentative statistic from the SFEI fish survey.

RWQCB relies upon the 95th percentile of the SFEI study's consumption rate distribution, which is unreasonable and results in an unreasonably high fish consumption rate. More than 70% of the anglers in the SFEI study did not eat any fish from SFB in the last four weeks. There were only 53 anglers at or above the 95th percentile of the consumption rate. Rather than relying on the consumption rate of 32 grams/day based only on the fish-eating habits of 53 anglers who, by definition, are extreme in their fish-eating habits, the more scientifically defensible approach would be for RWQCB to rely on measures of central tendency such as the mean or median values.[120]

7. SFB Sediments Are Not Net Erosional; Areas Of Deposition Tend To Correspond To "Hot Spot" Areas

RWQCB misleadingly overstates the degree to which resuspensional effects of winds and waves and erosion may remobilize buried PCBs in the Bay.[121] The Project Report's

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116 Fish consumption rates were calculated based upon portion size multiplied by the number of meals eaten. To determine portion size, interviewers showed anglers an 8-ounce model before asking what size fish they typically ate, and then asked anglers whether they more or less ate about the size of the model. More than half of the respondents provided an affirmative response, suggesting that they simply adopted the suggestion provided by the interviewer (i.e., the 8-ounce portion size was about the amount they ate).

117 Tab E (Mathews Expert Report) at 8.

118 Id.

119 SFEI study at 72.

120 Tab E (Mathews Expert Report) at 2-3.

121 See, e.g., Project Report at 7 ("This erosion could uncover contaminated sediments, resulting in increased availability of PCBs to the food web. Even if all contaminated current PCBs sources to the Bay are eliminated, exposure of historically contaminated sediment may turn out to be a significant PCBs source to organisms."); id. at 8 (estimating 160 million cubic yards of sediments are resuspended annually from shallow

emphasis on erosion and resuspension as primary transport mechanisms for sediments is misplaced for the following reasons:

- The existence of discrete areas of erosion in the Bay does not mean that the Bay as a whole is dominated by erosion.[122]

- On the contrary, significant portions of the Bay are depositional, meaning that clean sediments continue to bury (already buried) sediments with higher levels of PCBs.[123]

- Bays and estuaries are widely regarded as "sediment traps," meaning that they are dominated by depositional areas that are traps for particulate matter. There is no evidence suggesting that SFB is any exception.[124]

- Even in areas where mixing of bottom sediments predominates, net burial is occurring.[125]

Of importance, the so-called "hot spot" areas primarily are located along the margins of SFB, in depositional pockets. Thus, natural recovery through burial appears to be a common phenomenon at these locations.

The Project Report should acknowledge that to the extent that erosion may be occurring, it does not appear to present significant risk in "hot spot" areas. However, overall, the depositional/erosional status of Bay sediments is not well defined, representing a significant uncertainty. In order to adequately characterize an overall sediment mass balance for the Bay, additional sediment transport studies, including the development of more sophisticated models, are needed.

V.

LEGAL ANALYSIS

The technical and scientific flaws and uncertainties associated with the TMDL render the TMDL legally unsound, as well as technically suspect. The Board has failed to establish the necessary predicates for establishing a TMDL. RWQCB has not proven that the

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areas of the Bay by wind-generated waves); id. at 27 ("the potential for sediments to be resuspended and supply PCBs to the water column is significant"); id. at 42 ("Continual mixing of bottom sediments from wave action or other disturbances, such as mixing by organisms (bioturbation) or erosion of bedded sediments, can provide an ongoing supply of PCBs to the water column and biota.").

122 Tab B (QEA Expert Report) at 28.

123 Id.

124 Id.

125 Id.

TMDL is established at a level *necessary* to implement the applicable water quality standards, that the TMDL is capable of being implemented, or that SFB will be in compliance with the applicable water quality standards if the TMDL, as proposed, were to be implemented. Further, the foundation for the TMDL is unlawful given that RWQCB has no authority under California law or the Clean Water Act to adopt the proposed sediment and fish targets. Should RWQCB continue to proceed with the TMDL as proposed, its actions would not be legally supportable.

A. The OEHHA Advisory Does Not Prove Impairment Of San Francisco Bay Or Provide A Basis For The TMDL

RWQCB cannot justifiably rely upon the 1994 OEHHA advisory to support the TMDL impairment assessment. The advisory was issued in 1994, according to OEHHA, to "be prudent." It was a precautionary advisory, not based on the establishment of a safe/unsafe threshold but, rather, advising the public as to conservative practices that might be adopted to avoid any risk altogether. In other words, OEHHA has never claimed that failure to adopt the recommended practices will expose people to unacceptable risk. In fact, the primary finding made by OEHHA when it issued the advisory was that a "health evaluation and risk assessment" should be conducted in light of the data upon which the advisory was issued. Because no formal risk assessment was conducted, the conditions and data on which the advisory was based have materially changed, and the advisory was not completed in accordance with current standards of the California Water Code, or former standards of the Fish & Game Code, the advisory provides no basis upon which RWQCB may conclude rationally that SFB is impaired for PCBs.

1. The OEHHA Advisory Is Not Based On A Determination Of Safe And Unsafe PCB Levels In Fish

OEHHA did not conduct a formal risk assessment to support its advisory. Instead, OEHHA staff made a back-of-the-envelope assessment based upon a review of a 1994 pilot study of fish tissue levels conducted by RWQCB. As OEHHA explained:

> In 1994, the San Francisco Bay Regional Water Quality Control Board . . . conducted a pilot study to measure the levels of chemical contaminants in fish in San Francisco Bay…. OEHHA, which is the state agency that issues sport fish consumption advisories, did a preliminary evaluation of the study data and confirmed the potential health hazard. OEHHA then issued an interim sport fish advisory…. The fish consumption advisory for San Francisco Bay issued in December 1994 was an interim advisory based on preliminary analysis of the pilot study data.[126]

In fact, RWQCB previously acknowledged the preliminary nature of the fish contaminant data and its inapplicability in determining human health risk:

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[126] Overview of San Francisco Bay Sport Fish Contamination and Response Activities, OEHHA, August 1999) at 1, 10.

> The study was designed as a pilot study to screen for chemicals of concern in the tissue of fish…. The basic goal of any pilot study is to provide the information which is needed to design a cost-effective comprehensive study…. This report is not a health risk assessment and should not be interpreted as guidance for the safety of consuming fish caught from the Bay.[127]

Given that OEHHA and RWQCB both have concluded that the OEHHA fish advisory is not an appropriate basis on which to measure risk to human health, it is incongruous and unreasonable for RWQCB to rely upon the same advisory as the primary basis for its TMDL impairment assessment. An adequate risk assessment "would include hazard identification, dose-response assessment, exposure assessment, risk assessment, and uncertainty analysis. It also would include an evaluation of all the fish tissue data collected, a spatially-explicit evaluation of exposure, consideration of fish species consumed and receptor classes (e.g., average fishers, frequent fishers), exposure duration, site-specific consumption rate, seasonality, and other exposure parameters."[128] The OEHHA advisory was not based upon any such assessment.

2. Changes In Circumstances Make Reliance On The OEHHA Advisory Improper

The PCB cancer slope factor used to develop water quality standards is lower now (2.0 mg/kg-day^{-1}) than it was in 1994 (7.7 mg/kg-day^{-1}) when the OEHHA advisory was issued.[129] This reduced cancer slope factor reflects the U.S. EPA's conclusion that exposure to PCBs presents much less of a health risk than had been believed in 1994. In addition, the OEHHA advisory assumed neurotoxicity and other non-cancer effects that a peer-reviewed, comprehensive weight-of-the-evidence review and other scientific literature have since shown to be highly questionable.[130] Thus, the 1994 OEHHA advisory is out of date.

3. RWQCB's Reliance On A 1994 Advisory Is Undercut By Legislation In 2000

Legislation enacted in 2000 addressed OEHHA's role with respect to screening studies, risk assessment and fish advisories.[131] Section 13177.5 does not mention "interim" advisories, raising a question as to the continued viability of the 1994 OEHHA advisory. Section 13177.5 requires OEHHA to issue an advisory when it determines that significant risk is

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127 Contaminant Levels in Fish Tissue from San Francisco Bay, Final Report, Regional Board, June 1995) at 1-2.

128 Tab D (BBL Expert Report of Ms. DeShields) at 2.

129 Exhibits 4-10 (General Electric's Comments on the PCB Toxicity Assumptions Underlying the Section 303(d) Listing of San Francisco Bay, submitted to SWRCB on November 1, 2002).

130 Id.

131 Cal. Water Code § 13177.5.

present -- a determination not present in this case.[132] Screening studies are contemplated by Section 13177.5, but no action is required of the State Board or Regional Boards on the basis of screening studies alone.[133] Rather, it is OEHHA that acts upon the screening study results, engaging in real risk assessment as warranted based on the screening results.[134]

Section 13177.5 casts a cloud on RWQCB's reliance on the 1994 advisory, and provides a basis for RWQCB to ascribe an appropriate low level of weight to the advisory.

4. The Department Of Fish And Game Did Not Impose Any Limitations Based On The OEHHA Advisory, Indicating The Advisory Was Not Viewed As Evidence Of A Human Health Threat

Under legislation in effect when OEHHA issued its advisory, the California Department of Fish and Game ("F&G") could have taken steps to protect the public if it considered the OEHHA advisory to be scientifically sound. Pursuant to Fish and Game Code Section 7715, this would have required a finding by OEHHA that fish from SFB posed a likely human health risk, based on "thorough and adequate scientific evidence."[135] The fact that F&G took no such steps confirms that the OEHHA advisory is not an appropriate basis for regulatory action designed to protect human health.

Furthermore, OEHHA had the authority only to "formally issue[]" an advisory,[136] which it did not do in 1994, or any time thereafter, as the advisory was not subject to formal notice and comment rulemaking. RWQCB's reliance on a fish advisory that did not go through a formal rulemaking circumvents the California Administrative Procedures Act ("APA").

5. The OEHHA Advisory Does Not Comply With U.S. EPA Guidance On The Use Of Fish Advisories In The 303(d) Listing Process

U.S. EPA directs states to rely on fish and/or shellfish consumption advisories to identify impaired waterbodies to include on 303(d) listings under certain defined conditions. Because the OEHHA advisory is inconsistent with U.S. EPA guidance, RWQCB is not required to use the advisory to support a 303(d) Listing for SFB. RWQCB has pointed to nothing in the record demonstrating that the OEHHA advisory nonetheless is a proper basis upon which to conclude SFB is impaired despite the fact that it does not meet U.S. EPA's guidance.

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132 Id., § 13177.5(e) (OEHHA "shall issue health advisories when the office determines that consuming certain fish or shellfish presents a significant health risk.").

133 Id., § 13177.5

134 Id., § 13177.5(e).

135 Cal. Fish & Game Code § 7715.

136 Id., § 217.6 ("Commencing with the booklet of sportfishing regulations published in 1987, the booklet shall also contain any human health advisories relating to fish which are formally issued by the Office of Environmental Health Hazard Assessment or summaries of those human health advisories.").

U.S. EPA regards a fish consumption advisory as relevant for determining impairment and inclusion on a 303(d) List if four conditions are met, including that "the risk assessment parameters (e.g., toxicity, risk level, exposure duration and consumption rate) of the advisory or classification are cumulatively equal to or less protective than those in the State, Territory, or authorized Tribal water quality standards."[137]

Here, elements of the risk evaluation used to develop the OEHHA advisory were extremely conservative. Specifically, a screening value for PCB contamination in fish of 3 ppb was used when OEHHA issued the advisory,[138] a value that is far more conservative than the 22 ppb fish tissue target RWQCB asserts must be met in order to meet RWQCB's water quality standards. On its face, a comparison of the two values (3 ppb used in the advisory versus 22 pbb used by RWQCB) shows that the risk assessment parameters of the OEHHA advisory are not "cumulatively equal to or less protective" than RWQCB's water quality standards.

In addition, the narrative toxicity standard of the Basin Plan was promulgated under the Porter-Cologne Act, which embraces a balanced approach to water quality protection -- not one based on excessive conservatism, as is the advisory. In fact, Porter-Cologne specifically requires OEHHA to issue coastal fish advisories only when OEHHA determines there is significant risk.[139] The 1994 advisory was based on no such significance determination by OEHHA.

B. RWQCB Has Not Demonstrated That PCBs In SFB Violate The Basin Plan's Narrative Toxicity Standard

The predicates for RWQCB action under its narrative standard do not appear to be present. The standard is intended to prevent increases of toxic substances. As the evidence presented in connection with these comments demonstrates, PCB concentrations within SFB have been in a state of steady decline for many years. In addition, only increases that produce an observable toxic effect are actionable under the standard; the mere presence of the compound is insufficient.[140] There are no empirical ecological data or human health data indicating any widespread effects due to current levels of PCBs in SFB. Further, only "controllable water quality factors" are actionable under this standard. RWQCB acknowledges that "historical use and/or disposal" of PCBs have created "legacy sources" from which "uncontrolled discharges of PCBs" still may be occurring.[141] The Project Report makes no effort to distinguish between controllable sources of PCBs that may be actionable and legacy sources that are not amenable to control.

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137 Letter from U.S. EPA Office of Water Quality, dated October 24, 2000 (WQSP-00-03).

138 Tab D (BBL Expert Report of Ms. DeShields) at 1-2.

139 Cal. Water Code § 13177.5.

140 Staff Report at 4 ("[I]t is presumed that there can, and usually will be, potentially toxic chemicals detected at some concentrations. However, one must observe a toxic effect to consider this a failure of the [narrative] standard.").

141 San Francisco Bay--PCBs TMDL Workplan (Draft June 1999) at 1.

As discussed in the prior section, nor can RWQCB rely on the 1994 fish advisory to conclude excursion of the narrative standard, since the advisory was not based on any epidemiology, or even a risk assessment to try to show that health effects are likely -- which we believe they are not. The fact that PCBs are considered a "probable" human carcinogen -- not one documented by definitive epidemiology -- is another example of why the presence of PCBs does not violate a narrative standard requiring the presence of observable, measurable effects.[142]

Further, the plain language of the narrative toxicity standard seems to address "water quality factors" acting upon and external to "bottom sediments or aquatic life," at most making actionable sources external to sediments, but not the sediments themselves. RWQCB appears to be interpreting the standard as authorizing mass removal of compounds -- in this case PCBs -- already in the sediment. The narrative toxicity standard provides no reasonable notice to the public that it could be applied or interpreted in this manner and therefore, in this respect, it violates due process and is void for vagueness.[143]

C. RWQCB Cannot Lawfully Rely On Non-Regulatory Values From U.S. EPA As The Basis For Its Sediment And Fish Targets

From the numeric targets, RWQCB derives PCB load reductions to be enforced through permit limits and other means. RWQCB proposes to incorporate these targets into its Basin Plan which is a regulatory document.[144] RWQCB has an obligation to justify the basis for its targets and demonstrate why they are necessary for SFB. RWQCB has not laid this foundation. Rather, RWQCB has borrowed the proposed targets from U.S. EPA guidance without any explanation as to why the U.S. EPA screening values, from national guidance,

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142 As set forth in Exhibit 4, there is little (if any) evidence that current exposure to PCBs in the environment causes cancer or neurological effects. See Exhibit 4 (General Electric's Comments on the PCB Toxicity Assumptions Underlying the Section 303(d) Listing of San Francisco Bay, submitted to SWRCB on November 1, 2002).

143 See, e.g., Franklin v. Leland Stanford Junior University, 172 Cal. App. 3d 322, 347 (1985) ("The notion of due process requires the prohibition be clearly defined in order to provide adequate notice or warning of the conduct which is prohibited.") (citing Grayned v. City of Rockford, 408 U.S. 104, 108 (1972)); Citizens for Responsible Behavior v. Superior Court, 1 Cal. App. 4th 1013, 1032 (1992) ("A statute which requires those subject to its provision to guess at its meaning is inherently violative of due process.") (citing Connally v. General Const. Co., 269 U.S. 385, 391 (1926)); Britt v. City of Pomona, 223 Cal. App. 3d 265, 278-80 (1990) (holding that ordinance whose terms are too vague to be understood and applied by persons of common intelligence violates due process requirements). The requirement of specificity is necessary to avoid "arbitrary and discriminatory" application and enforcement of the standard. Valiyee v. Dep't of Motor Vehicles, 74 Cal. App. 4th 1026, 1032-33 (1999); People v. Townsend, 62 Cal. App. 4th 1390, 1400 (1998); Franklin v. Leland Stanford Junior University, 172 Cal. App. 3d at 347.

144 State Water Resources Control Board v. Office of Administrative Law, 12 Cal. App. 4th 697, 701 (1993) (basin plans are regulations).

should be accorded force of law in SFB. RWQCB's reliance on these non-regulatory screening values is arbitrary and capricious and unsupported by substantial evidence.

1. The Sediment Target Is A Value Used By U.S. EPA To Survey Sediments For A National Inventory Of Potentially Impacted Sites

In a 1997 report required by the Water Resources Development Act of 1992 ("WRDA"), U.S. EPA used a "reference value" of 2.5 ppb to identify sediment sites where a "sediment ecotoxicological assessment might indicate a potential threat to aquatic life."[145] Without any ecotoxicological assessment of its own, or any other site-specific analysis, RWQCB incorporated U.S. EPA's "reference value" into the Project Report as its proposed sediment target. U.S. EPA appears to have used the reference value as a basis to screen for potential effects on aquatic life. Without explanation, RWQCB proposes to use this value as a threshold to protect people from potential bioaccumulation up the food chain, a use not apparently intended by U.S. EPA. Even assuming the value could be used as a target -- which it cannot -- RWQCB does not explain how a reference value for aquatic life is relevant to a human health endpoint.

The WRDA did not authorize U.S. EPA to develop regulatory standards for sediment management. Rather, it directed U.S. EPA to "conduct a comprehensive national survey of data regarding aquatic sediment quality in the United States," and required U.S. EPA to "compile all existing information on the quantity, chemical and physical composition, and geographic location of pollutants in aquatic sediment."[146] U.S. EPA recognized the limits of the WRDA, explicitly stating in the 1997 report that, "[t]he sediment chemistry screening values used in this report are not regulatory criteria, site-specific cleanup standards, or remediation goals."[147]

Despite these words of limitation, RWQCB is proposing to use the U.S. EPA "reference value" as "regulatory criteria," without any articulation of why it is appropriate to do so. RWQCB's proposal is unlawful, and directly contrary to U.S. EPA guidance regarding their relevance and use.

2. Likewise, RWQCB's Proposed Fish Target Is A U.S. EPA Screening Value Borrowed From U.S. EPA Guidance

The fish target is likewise based on a screening value approach utilizing highly conservative assumptions, including a fish consumption rate that has no relevance to the

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145 See U.S. EPA (1997b) (The Incidence and Severity of Sediment Contamination in Surface Waters of the United States. Volume 1: National Sediment Quality Survey. Office of Science and Technology) at p. 2-12.

146 33 U.S.C. § 1271.

147 U.S. EPA (1997b) (The Incidence and Severity of Sediment Contamination in Surface Waters of the United States. Volume 1: National Sediment Quality Survey. Office of Science and Technology) at p. 2-12.

consumption of bottom-foraging fish and is biased upwards according to the survey authors.[148] U.S. EPA itself concluded that screening values merely serve as guidelines for determining whether further site-specific analysis may be needed.[149] They were not developed and should not be used as the basis for any other conclusions.

D. The Sediment And Fish Targets Bear No Reasonable Nexus To RWQCB's Water Quality Standards

RWQCB claims that the sediment and fish targets are necessary to implement the Basin Plan's narrative bioaccumulation standard and the sportfishing beneficial use for SFB.[150] The narrative bioaccumulation standard provides that, "[c]ontrollable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life."[151] The sportfishing beneficial use, the so-called "COMM" designation, is defined to include, "uses of water for commercial or recreational collection of fish, shellfish, or other organisms in oceans, bays, and estuaries, including, but not limited to, uses involving organisms intended for human consumption or bait purposes."[152] RWQCB fails to establish any reasonable nexus between its proposed targets and these Basin Plan standards, as it is required to do under the federal Clean Water Act and California law.

A TMDL "shall be established at a level *necessary* to implement the applicable water quality standards…."[153] Under California law, agencies must "articulate a 'rational connection between the facts found and the choice made.'"[154] When RWQCB establishes a TMDL for a particular pollutant, it must provide evidence that once the TMDL is implemented, the watershed will be in compliance with the applicable water quality standards. RWQCB has

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148 See, supra, n. 110.

149 See, supra, n. 107.

150 See, e.g., Project Report at 48 ("The fish tissue target is designed to implement the narrative water quality objective for bioaccumulation."); id. at 21 (stating that the fish target "applies directly to the attainment of the COMM beneficial uses"); id. at 47 ("As with the fish tissue target, we use existing sediment guidelines . . . to develop a sediment PCBs concentration protective of beneficial uses.").

151 Basin Plan at 3-2.

152 Basin Plan at 2-2.

153 33 U.S.C. § 1313(d)(1)(C) (emphasis added).

154 Bowman Transp., Inc. v. Arkansas-Best Freight System, Inc., 419 U.S. 281, 285-86 (1974) (citations omitted). See also Lusardi Construction Co. v. California Occupational Safety & Health Appeals Bd., 1 Cal. App. 4th 639, 643 (1991) (agencies must "appl[y] the proper legal standard" to a decision that "involves the interpretation and application of existing regulations"); Industrial Union Dep't, AFL-CIO v. American Petroleum Institute, 448 U.S. 607, 705 (1970) ("We have observed that the arbitrary and capricious standard itself contemplates a searching 'inquiry into the facts' in order to determine 'whether the decision was based on a consideration of the relevant factors….'") (quoting Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402, 416 (1971)).

made no such showing. RWQCB has not demonstrated any connection between the sediment and fish targets on the one hand, and attainment of these water quality standards on the other hand. There is an essential link missing in the Project Report. That link is a valid mechanism to translate the narrative Basin Plan standards into a numeric target. Where a state seeks to regulate the discharge of toxic pollutants into water quality limited segments (i.e., the TMDL program) based on narrative criteria, the state must first adopt a "translator procedure" describing how such narrative criteria will be translated into standards that can be readily applied to point source discharges.[155] Governing U.S. EPA regulations expressly provide for this translator mechanism:

> Where a State adopts narrative criteria for toxic pollutants to protect designated uses, the State must provide information identifying the method by which the State intends to regulate point source discharges of toxic pollutants on water quality limited segments based on such narrative criteria. Such information may be included as part of the standards or may be included in documents generated by the State in response to the Water Quality Planning and Management Regulations.[156]

In the absence of this key analytical link, RWQCB resorted to improper reliance on the screening values, as discussed above. However, these screening values were not developed to implement RWQCB's water quality standards, and RWQCB offers no rationale for their use in this manner.

The absence of any reasonable nexus between the numeric targets and the corresponding beneficial uses and narrative criteria they purportedly are designed to achieve is not surprising given the manner in which they were developed. In 1999, RWQCB admitted that it had insufficient evidence and data to establish numeric targets.[157] The administrative record is replete with admissions regarding the "uncertainties" and "data gaps" associated with the development of the numeric targets and the TMDL. RWQCB cannot dismiss these significant limitations by merely claiming that RWQCB is dealing with "policy issues."[158]

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155 40 C.F.R. § 131.11(a)(2); City of Los Angeles v. U.S. EPA, C.D. Cal., Case No. CV 00-08919, Order Granting Summary Judgment and Remanding to EPA, Dec. 18, 2001, p. 10.

156 40 C.F.R. § 131.11(a)(2).

157 See, supra, pp. 9-11.

158 RWQCB has admitted that it made certain "policy" choices in calculating its fish target. See Project Report, comment of Fred Hetzel regarding fish screening values from electronic files produced by RWQCB ("Note that I used mean concentration based on EPA reference. If I use mean for all consumers (6.3 g/day), I get a target of 111 ng/g. With 95%ile number used for mercury, I get 22 ng/g. With 95%ile number for recent consumers (108g/day, I get 6 ng/g. THIS IS A POLICY ISSUE TO BE DISCUSSED. Also need to look at how much of these types of fish are consumed and where."). The Project Report does not, however, provide a rationale for the choices RWQCB proposes to make, or evidence that those choices were reasonable.

Although some time has passed since these statements were made, RWQCB has not identified what intervening information and data (if any) became available or how this information was used to justify the Board's sediment and fish targets. The Board likewise has failed to demonstrate how the targets will result in the attainment of the narrative bioaccumulation standard.

E. The Fish And Sediment Targets Are Beyond The Scope Of RWQCB's Statutory Authority

The fish and sediment targets proposed by RWQCB are the critical values underlying the entire TMDL. The Board uses these numeric targets as proxies for California's promulgated water quality standards, to determine what load reductions are required, and as benchmarks against which to judge the control actions required under the TMDL implementation program.[159]

These actions give the targets force of law. Because the targets are not derived on the basis of technical considerations from the agency's water quality standards, they constitute new standards for which RWQCB did not follow proper rulemaking procedures. Thus, they are invalid in this respect. More fundamentally, however, the targets are invalid because RWQCB has no authority to adopt these targets *at all* -- irrespective of whether it attempts to follow proper administrative procedure. The Board has not complied with the substantive requirements for adopting water quality objectives and has no authority to adopt sediment quality objectives. Thus, the fish and sediment targets are unlawful and void.

1. The Numeric Targets Constitute Invalid Regulations

The California Legislature adopted the APA[160] to ensure that persons or entities who are impacted by a regulation will have a voice in its creation, and to protect the public from abuses of agency power.[161] The provisions of the APA apply to any exercise of *any*

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159 See, e.g., Project Report at 3 (introducing the "numeric targets associated with attaining applicable water quality objectives"); id. (introducing "an initial framework of the control actions needed to implement load reductions/allocations and attain the numeric targets"); id. at 27 ("Numeric targets are derived as measurable conditions that demonstrate attainment of water quality standards. These numeric targets are then used to develop proposed load and wasteload allocations for PCBs discharges to the Bay.").

160 Cal. Gov't Code §§ 11340 et seq.

161 Armistead v. State Personnel Bd., 22 Cal. 3d 198, 204 (1978). The California Supreme Court clearly expressed this purpose, stating: "The Legislature wisely perceived that the party subject to regulation is often in the best position, and has the greatest incentive, to inform the agency about possible unintended consequences of a proposed regulation. Moreover, public participation in the regulatory process directs the attention of agency policymakers to the public they serve, thus providing some security against bureaucratic tyranny." Tidewater Marine Western, Inc. v. Bradshaw, 14 Cal. 4th 557, 569 (1996).

quasi-legislative power by any agency, unless expressly exempted by the Legislature.[162] An agency action is quasi-legislative (as opposed to quasi-judicial) in nature when the action constitutes the formulation of policy intended to govern future decisions, rather than the application of existing rules to the facts of an individual case.[163]

The California Supreme Court in Tidewater articulated and applied a two-part test that the courts use in determining whether a challenged agency action constitutes a "regulation" under California law.[164] First, the courts determine whether the agency action applies generally, rather than in a specific case. Second, the courts determine whether the agency action implements, interprets or makes specific the law enforced or administered by an agency or governs an agency's procedure.[165]

Under the first prong, the relevant question is whether the agency *intended* for the regulation to apply generally.[166] Under the second prong, a broad variety of agency action is regulatory.[167] The critical factor in all cases is the *impact and effect* of the agency action, not the label placed on such conduct by the agency. The Court of Appeal in State Water Resources Control Board v. Office of Administrative Law, 12 Cal. App. 4th 697 (1993) clearly articulated this point, stating:

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162 Cal. Gov't Code § 11346; Tidewater, supra, 14 Cal. 4th at 570.

163 See 20th Century Ins. Co. v. Garamendi, 8 Cal. 4th 216, 275 (1994); Beck Dev. Co. v. Southern Pacific Transp. Co., 44 Cal. App. 4th 1160, 1188 (1996) (quasi-legislative acts implement statutorily granted powers and "involve the adoption of rules of general application on the basis of broad public policy").

164 Cal. Gov't Code § 11342.600 defines "regulation" very broadly to include: "[E]very rule, regulation, order, or standard of general application or the amendment, supplement, or revision of any rule, regulation, order, or standard adopted by any state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure."

165 Tidewater, 14 Cal. 4th at 571.

166 Id. (holding that a rule need not apply universally, as long as the rule dictates how a certain class of cases will be decided); see also Armistead, 22 Cal. 3d at 204 (concluding that a provision contained in the Board's Personnel Transactions Manual governing withdrawal of employee resignations was a regulation where it "*obviously was intended to be generally applied*, to make specific for all state civil service employees the limits on their right to withdraw resignations.") (emphasis added).

167 See, e.g., Engelmann v. State Bd. of Educ., 2 Cal. App. 4th 47, 62 (1991) (agency actions that "depart from, or embellish upon express statutory authorization and language" constitute "regulations"); Tidewater, 14 Cal. 4th at 574-75 (court rejected argument that interpretative regulations are not quasi-legislative because an agency does not adopt them pursuant to delegated authority, and found that "[a] written statement of policy that an agency intends to apply generally, that is unrelated to a specific case, and that predicts how the agency will decide future cases is essentially legislative in nature….").

> [T]he . . . Government Code . . . [is] careful to provide OAL authority over regulatory measures whether or not they are designated "regulations" by the relevant agency. In other words, if it looks like a regulation, reads like a regulation, and acts like a regulation, it will be treated as a regulation whether or not the agency in question so labeled it.[168]

In this case, the numeric targets are standards of general applicability designed to implement and interpret applicable water quality requirements RWQCB is charged with enforcing, and they are designed to specify what actions are needed to implement the TMDL identified by RWQCB. The Board has abandoned any intent to determine the appropriate "numeric target" to apply on a case-by-case basis, but rather has determined that all load allocations, waste load allocations, and load reductions shall be based upon these targets alone.

This is analogous to the situation in Simpson Tacoma Kraft v. Dep't of Ecology, 835 P.2d 1030 (Wash. 1992), where the court concluded that the State Department of Ecology's numeric standard for dioxin was invalid and unenforceable due to Ecology's failure to follow statutorily mandated rulemaking procedures in adopting the standard. Ecology applied the state's narrative standard, which stated that toxic substances shall not be introduced into a waterbody at levels that may adversely affect public health, to dioxin and determined that discharges above .013 parts per quadrillion may adversely affect public health. "Ecology arrived at this numeric standard by using federal guidance and federal data, but without going through rule-making procedures."[169] Based on the fact that the state agency applied its numeric standard "uniformly to the entire class of entities" which discharged dioxin into the regulated waterbody, the court concluded that the standard was "of general applicability" within the meaning of the state's law.[170] This holding is consistent with the district court's decision in Asarco Inc., et al. v. State of Idaho, et al., Case No. CV-00-05760 (D.C. Idaho 2001), where the court found that Idaho's TMDL was "invalid and of no force and effect" because the Idaho Department of Environmental Quality ("IDEQ") did not follow state rulemaking requirements. Id. at 23. The court reasoned, *inter alia*, that "the TMDL was intended to be applied generally and uniformly to similarly situated persons" and therefore constituted "rulemaking" subject to the state's APA. Id. at 21.[171]

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168 12 Cal. App. 4th at 703 (emphasis added).

169 Id. at 1032.

170 Id. at 1035. Under Washington law, a "regulation" is defined as "any agency order, directive, or regulation of general applicability . . . the violation of which subjects a person to a penalty or administrative sanction...." Id. at 1034 (citations omitted).

171 The court also based its decision on the fact that (1) "there was wide coverage encompassing a large segment of general public rather than an individual or a narrow select group"; (2) "the TMDL operates only prospectively and does not adjudicate past actions"; (3) "the TMDL creates legal standards in the form of TMDLs, WLAs, and LAs, that are not inferable from the enabling statutes"; (4) "the TMDL reflects a new administrative policy"; and (5) "the TMDL interprets the Idaho Water Quality Act and

Similarly here, RWQCB has identified generally applicable numeric targets, based in part on non-regulatory measures from other agencies, without going through the proper rulemaking proceedings. As such, RWQCB's actions are unlawful.[172]

2. RWQCB Exceeded The Scope Of Its Statutory Authority In Adopting The Sediment And Fish Targets

"Administrative agencies have only the powers conferred on them, either expressly or impliedly, by the Constitution or by statute, and administrative actions exceeding those powers are void."[173] As stated by the California Supreme Court:

> [I]t is well established that the rulemaking power of an administrative agency does not permit the agency to exceed the scope of authority conferred on the agency by the Legislature.... And, a regulation which impairs the scope of a statute must be declared void.[174]

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sets policy for implementing the Federal Clean Water Act." Id. The court found that not all of these factors need to be present in order to find that agency action was "rulemaking." Id. at 18.

172 The State Board itself has stated that numeric targets in TMDLs are analogous to water quality objectives, and constitute "performance standards" under CEQA, thereby confirming that the numeric targets are subject to the APA requirements. See Exhibit 1 (1994 State Board Memo) at 7 ("For a TMDL whose goal is to achieve a standard based primarily on nonattainment of a designated beneficial use, for which there are no applicable objectives, a numeric target is established for each pollutant or stressor that interferes with attaining the use. *Establishing a numeric target in these instances is analogous to establishing water quality objectives*....") (emphasis added); id. (stating that "numeric targets and load allocations would probably fall into the category of performance standards"). See also Cal. Pub. Res. Code § 21159 (requirements are triggered "at the time of the *adoption of a rule or regulation* requiring . . . a performance standard") (emphasis added); State Water Resources Control Board v. Office of Administrative Law, 12 Cal. App. 4th 697, 707 (holding that Regional Board's Water control plan amendments were regulations subject to the APA).

173 Terhune v. Superior Court, 65 Cal. App. 4th 864, 872 (1998).

174 Agnew v. California State Bd. of Equalization, 21 Cal. 4th 310, 321 (1999) (emphasis added); accord, e.g., Terhune, 65 Cal. App. 4th at 873 ("No matter how altruistic its motives, an administrative agency has no discretion to promulgate a regulation that is inconsistent with the governing statutes."); Masonite Corp. v. Superior Court, 25 Cal. App. 4th 1045, 1053 (1994) ("An administrative agency has no discretion to promulgate a regulation which is inconsistent with the governing statute.").

"'Administrative regulations that alter or amend the statute or enlarge or impair its scope are void and courts not only may, but it is their obligation to strike down such regulations.'"[175]

The Legislature never granted RWQCB the power under the Porter-Cologne Act to identify or promulgate "targets." Both the sediment and fish target therefore are *ultra vires* and facially invalid. Not only is there no explicit authority to adopt targets, RWQCB also cannot establish that its actions are somehow implicitly authorized under Chapter 5.5 of the Porter-Cologne Act, under the guise that it is adopting the targets to "implement the provisions of the Federal Water Pollution Control Act."[176] Any such argument would be unfounded. The Legislature provided that, "[t]he provisions of [Chapter 5.5] shall apply only to actions *required* under the Federal Water Pollution Control Act and acts amendatory thereof or supplementary thereto."[177] A sediment target is not required or authorized by the Clean Water Act, and sediment targets are not used in the vast majority of PCB TMDLs.[178]

3. Even If The Sediment Target Is Equated With A "Sediment Quality Objective," It Is Invalid Because It Is Beyond The Scope Of RWQCB's Authority And Substantively Defective

The Board cannot support its sediment target on the ground that it constitutes a sediment quality objective because only the "state board shall adopt sediment quality objectives…."[179] The legislature clearly delineated the duties of the State Board and Regional Boards.[180] There is nothing in the governing statute indicating that RWQCB has concurrent jurisdiction to adopt sediment quality objectives.

Even if RWQCB had jurisdiction to promulgate sediment quality objectives (which it does not), it did not follow the necessary procedures for promulgating such objectives.

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175 California Ass'n of Psychological Providers v. Rank, 51 Cal. 3d 1, 11 (1990) (quoting Morris v. Williams, 67 Cal. 2d 733, 748 (1967)).

176 Cal. Water Code § 13370.

177 Cal. Water Code § 13372 (emphasis added).

178 See, e.g., Total Maximum Daily Loads for Polychlorinated Biphenyls (PCBs) for Zones 2 – 5 of the Tidal Delaware River; Draft Total Maximum Daily Load Evaluation for Four Segments of the South River in the Ocmulgee River Basin (PCBs); Total Maximum Daily Load Evaluation Chattahoochee River (PCBs in Fish Tissue); PCB TMDL for Old Little Tallahatchie River; Total Maximum Daily Load for Polychlorinated Biphenyls for the Kawkawlin River, Bay County, Michigan; Total Maximum Daily Loads of Chlordane and Polychlorinated Biphenyls for Allegheny River.

179 Cal. Water Code § 13393(a).

180 Compare Cal. Water Code § 13392 (requiring "the state board and regional boards" to "identify specific discharges or waste management practices which contribute to the creation of toxic hot spots"), with Cal. Water Code § 13392.6(a) ("the state board shall adopt and submit to the Legislature a workplan for the adoption of sediment quality objectives….").

Sediment quality objectives can only be promulgated in accordance with the procedures set forth in Chapter 5.6 of the Water Code.

Pursuant to Chapter 5.6, the *State* Board must prepare a detailed workplan for its proposed adoption of sediment quality objectives for selected toxic pollutants or pollutants of concern.[181] The *State* Board must adopt a sediment quality objective in accordance with the workplan that it prepares and submits to the Legislature, and must follow the Section 13240-13247 procedures for adopting or amending Basin Plans.[182] Significantly, the *State* Board is authorized to adopt sediment quality objectives based only on sound scientific evidence and a thorough human health risk assessment.[183] The health risk assessment must contain "an analysis which evaluates and quantifies the potential human exposure to a pollutant that bioaccumulates or may bioaccumulate in edible fish, shellfish, or wildlife."[184]

The TMDL is not based on any human-health based risk assessment that considers real exposure and real risk, as required by the provisions of Chapter 5.6. Instead, it is based on the OEHHA 1994 "interim" fish consumption advisory, which is improper for several reasons. As discussed above, no risk assessment was ever conducted to support the advisory, and the advisory was never intended to be used as a basis for interpreting whether fish were unsafe to eat. It therefore is clearly improper for RWQCB to rely on an advisory prepared by a different agency for a different purpose without independently determining whether the advisory supports the adoption of a sediment quality objective -- particularly since RWQCB has no authority to adopt any sediment quality objectives at all. Instead, the State Board should be permitted to consider adopting sediment quality objectives based on appropriate health risk assessments. To satisfy the California Water Code, risk assessment methods employed must produce a reasonable and realistic characterization of risk. Thus, any risk assessment that forms the basis for the development of actual or de facto sediment quality objectives must use site-specific information such as who is eating the fish, shellfish, or wildlife, the frequency of consumption, in what quantities, etc.

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181 Cal. Water Code § 13392.6(a). The *State* Board is required to consult with a broad array of interests in preparing its workplan. See Cal. Water Code § 13392.6(b) ("In preparing the workplan pursuant to subdivision (a), the state board shall conduct public hearings and workshops and shall consult with persons associated with municipal discharges, industrial discharges, other public agencies, research scientists, commercial and sport fishing interests, marine interests, organizations for the protection of natural resources and the environment, and the general public.").

182 Id. § 13393(b). As discussed below, the Regional Board has not complied with the provisions of §§ 13240-13247.

183 See id. § 13393(b) ("The sediment quality objectives shall be based on scientific information, including, but not limited to, chemical monitoring, bioassays, or established modeling procedures, and shall provide adequate protection for the most sensitive aquatic organisms. The state board shall base the sediment quality objectives on a health risk assessment if there is a potential for exposure of humans to pollutants through the food chain to edible fish, shellfish, or wildlife.").

184 Cal. Water Code § 13391.5(c).

Moreover, the protectiveness of sediment quality objectives must be consistent with the Policies of Division 7 of the Water Code. Section 13393(b) requires the *State* Board to provide "adequate" protection for the most sensitive aquatic organisms. "Adequate" protection must be determined in a manner consistent with Water Code Sections 13000 and 13001 of Chapter 1 of Division 7. Water Code Section 13000 requires that activities and factors that may affect the quality of water be regulated to the "highest water quality which is reasonable" by "considering all demands being made and to be made on [the] water[] and the total values involved, beneficial and detrimental, economic and social, tangible and intangible."[185] Water Code Section 13000, and the Porter-Cologne Act's legislative history, require a substantive balancing of these factors. Water Code Section 13001 states that the State Board and Regional Boards "shall conform to and implement the policies" set forth in Section 13000 when exercising any power in Division 7. Since sediment quality objectives are required under Division 7, the Section 13000 policies apply. Therefore, the proposed TMDL must address the balancing test under Water Code Section 13000 and explain how it is to be met. This balancing test should focus on, among other relevant considerations, sediment quality, benthic community protection, socioeconomics, and the feasibility of such protection.

4. Even If The Targets Are Equated With Water Quality Objectives, They Are Unlawful Because RWQCB Failed To Comply With The Requirements Of Water Code Sections 13241 And 13242

Under state law, water quality standards must take into consideration what water quality is reasonably achievable in light of social and economic factors.[186] RWQCB failed to properly consider economics when adopting the targets.[187]

The Board relied on the targets to conclude that the narrative objectives in the Basin Plan were not currently being attained, but failed to "identify the methods which are presently available for complying with the objective."[188] RWQCB also failed to consider all "available information on the costs associated with the treatment technologies or other methods" which may be available to comply with the Board's proposed objectives.[189] In the face of evidence demonstrating that the economic consequences of adoption of RWQCB's proposed water quality objectives are clearly significant, RWQCB's failure to "articulate why adoption of the objective is necessary to ensure reasonable protection of beneficial uses" is also of concern.[190]

RWQCB cannot legitimately claim that it is merely applying a preexisting narrative standard, and therefore is not required to consider economic (and other) factors

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185 Cal. Water Code § 13000.

186 Cal. Water Code § 13241.

187 Cal. Water Code § 13241(c); Exhibit 1 (1994 State Board Memo).

188 Id.

189 Id.

190 Id. at 5.

pursuant to Section 13241. When adopting the narrative standard, RWQCB could not have anticipated, and did not anticipate that its narrative standards would be applied as they are being applied in this TMDL. RWQCB merely adopted a general, vague narrative standard in a vacuum without considering how the standard would be applied to specific scenarios such as those implicated by the TMDL. If RWQCB were permitted to avoid performing the analysis required under Section 13241 now, it would essentially circumvent the statute entirely because the statutory factors were not adequately considered when the narrative standard was first adopted. Permitting RWQCB to avoid the requirements of Section 13241 in connection with this TMDL would subvert the intent of the statute.

RWQCB's adoption of the numeric targets is invalid for the independent reason that the Board failed to adopt an appropriate program of implementation with respect to water quality objectives as required under Water Code Section 13242.

F. Both The Clean Water Act And The Porter-Cologne Act Require A TMDL To Be Based On The Capacity Of The Waterbody To Assimilate The Target Compound; RWQCB's Characterization Of The Assimilative Capacity Of SFB Is Incorrect

A TMDL is an expression of the amount of a compound that a waterbody may receive without exceeding applicable water quality standards. This measure is referred to as the loading capacity or the assimilative capacity. Once the loading capacity is known, it is then distributed among various sources, with a margin of safety reserved, and reflecting seasonal variation. However, the distribution step is taken only after a valid characterization of the loading capacity is made. RWQCB's characterization of the loading capacity is fatally flawed as it is based on an incorrect model of SFB which produces invalid estimates of assimilative capacity.

Both the Clean Water Act and the Porter-Cologne Act require assimilative capacity to serve as the cornerstone of a TMDL. U.S. EPA states that, "[t]he TMDL document must describe the relationship between numeric target(s) and identified pollutant sources, and estimate total assimilative capacity (loading capacity) of the waterbody for the pollutant of concern."[191] The Porter-Cologne Act recognizes that, "it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses."[192] The legislative history of the Porter-Cologne Act states that, assimilation is "recognized as part of the necessary

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191 See Guidance for Developing TMDLs in California, EPA Region 9 (January 7, 2000) at 4. See also id. at 4 ("Because the source analysis provides the key basis for determining the levels of pollutant reductions needed to meet water quality standards, and the allowable assimilative capacity, TMDL, wasteload allocations, and load allocations, quantified source analyses are required.").

192 See Cal. Water Code § 13241 ("it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses").

facts of life," and that "the very continuance of society depends upon some utilization of the waste assimilative capacity of the waters of the state."[193]

On the basis of the flawed one-box model, RWQCB erroneously concludes that the assimilative capacity of SFB is exceeded, and will continue to be exceeded indefinitely, unless external loads are decreased. This fundamental misconception renders the TMDL invalid, and undermines any attempt on the part of the agency to distribute appropriately the loading capacity among various sources, and to calculate a margin of safety.[194] In order to develop a valid TMDL, RWQCB must first determine the loading capacity by including a defensible estimate of SFB's ongoing natural recovery, which the Project Report currently is lacking. As Dr. Connolly's work demonstrates, "the weight of evidence indicates strongly that PCB levels within San Francisco Bay are recovering with half-lives of between 6 and 10 years," and "the rate of recovery does not appear to be slowing."[195] By failing to account for SFB's ability to receive and assimilate PCBs through the process of natural recovery driven primarily by tidal flushing, the Project Report mischaracterizes the loading capacity of the waterbody. This error affects the entire TMDL. "The sum of loads and margin of safety needs to be such that over time the assimilative capacity of the Bay will be attained."[196] Without a valid estimate of SFB's assimilative capacity, it is impossible to determine what load allocations and proposed load reductions are necessary.

G. RWQCB'S Inability To Quantify A Load Reduction For PCBs In Sediments Renders The TMDL Invalid, At Least As A Means To Regulate Sediment

RWQCB concedes that it cannot quantify a load reduction for PCBs in sediment necessary to meet water quality standards. This concession is noteworthy for two reasons.

First, RWQCB's failure to quantify a load reduction arguably invalidates the entire TMDL, since RWQCB believes that the sediment source is so central to the impairment

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193 Final Report of the Study Panel to the California State Water Resources Control Board (March 1969) at 12, 21.

194 Due to these errors, RWQCB's model does not meet the standards of scientific reliability under People v. Kelly, 17 Cal. 3d 24, 30 (1976). RWQCB cannot establish that its methods are reliable and generally acceptable, or that correct scientific procedures were used in this particular case. People v. Brown, 91 Cal. App. 4th 623, 626 (2001) (setting forth California Supreme Court's "three-step test for the admission of evidence generated by a new scientific technique: (1) the reliability of the technique must be sufficiently established to have gained general acceptance in the relevant scientific community; (2) the witness providing the evidence must be properly qualified as an expert; and (3) the evidence must establish that, in the particular case, the correct and accepted scientific technique was actually followed") (citing People v. Kelly, 17 Cal. 3d at 30).

195 Tab B (QEA Expert Report) at 16.

196 Project Report at 53.

RWQCB believes to be present. The development of a TMDL is a numerical process.[197] The inability to quantify a TMDL allocation for sediment PCBs indicates that PCBs are not "suitable for such calculation,"[198] and that the "proper technical conditions"[199] are not present to enable a valid TMDL to be developed.

Second, the absence of a quantifiable load reduction for PCBs in sediments means that RWQCB has concluded it is not necessary to reduce PCBs in sediments in order to reach the TMDL targets. This is inconsistent with RWQCB's suggestions elsewhere in the Project Report that these reductions are necessary in order to meet applicable water quality standards. In any event, RWQCB's failure to quantify a load reduction for PCBs means that RWQCB cannot properly use the proposed TMDL to regulate sediments.

H. Various Errors And Uncertainties In The Project Report Undermine The Proposed TMDL As The "Proper Technical Conditions" Are Not Present

Whether "proper technical conditions" exist to render a pollutant suitable for TMDL calculation "must be determined on a case-by-case basis."[200] "'Proper technical conditions' refers to the availability of the analytical methods, modeling techniques and data base necessary to develop a *technically defensible* TMDL. These elements will vary in their level of sophistication depending on the nature of the pollutant and characteristics of the segment in question."[201] This standard is not met in the present case because the analytical methods and modeling techniques used by RWQCB are unsound, and the database of information it relied upon was insufficient to develop a technically defensible TMDL.

I. RWQCB Has Not Provided, And Cannot Provide, "Reasonable Assurances" That Water Quality Standards Will Be Attained Within A Reasonable Period Of Time

"The phased approach to TMDL development recognizes that water quality standards cannot be attained immediately, but TMDLs developed on this basis nevertheless must

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197 Guidance for Developing TMDLs in California, EPA Region 9 (January 7, 2000) at 2-3 ("In situations where applicable water quality standards are expressed in narrative terms or where 303(d) listings were prompted primarily by beneficial use or antidegradation concerns, it is necessary to develop a quantitative interpretation of narrative standards. Since *a TMDL is an inherently quantitative analysis*, it is necessary to determine appropriate quantitative indicators of the water quality problem of concern in order to calculate the TMDL.") (emphasis added).

198 33 U.S.C. § 303(d)(1)(C).

199 43 Fed. Reg. 60662, 60665 (December 28, 1978) ("EPA's identification is as follows: *All pollutants, under the proper technical conditions, are suitable for the calculation of total maximum daily loads*. The Agency believes that under the proper technical conditions total maximum daily loads (TMDL's) and wasteload allocations can be developed for all pollutants.") (emphasis in original).

200 43 Fed. Reg. 60665.

201 Id. (emphasis added).

reflect *reasonable assurances that water quality standards will be attained within a reasonable period of time*."[202]

The Board in this case has failed to provide any assurances that the load allocations are technically feasible and reasonably assured of being implemented in a reasonable period of time. The load allocations are fundamentally flawed because RWQCB has not pointed to any competent evidence establishing where the bioavailable PCBs are coming from. The Board therefore cannot know that its implementation plan will work because it is unclear whether it is being appropriately directed. Currently, RWQCB places heavy emphasis on cleaning sediment "hot spots," but provides no specific information as to how it intends to bring SFB sediments down to 2.5 ppb. As our experts have shown, the fish target will not be met even if it were technically feasible to clean all the "hot spots" down to that level. Because RWQCB has not prepared a risk assessment for SFB that considers population and individual exposure, the Board simply cannot provide any reasonable assurances regarding what measures need to be implemented to result in attainment of water quality standards. The Board cannot and does not know what levels of PCBs in fish are safe. Safe levels likely are much higher than 22 ng/g.[203]

In a prior draft of the TMDL, RWQCB acknowledged its inability to provide reasonable assurances that the TMDL would meet the water quality standards in a reasonable period of time:

> Reasonable assurances must be provided that the TMDL targets can be achieved and that the applicable water quality standard can be met. Due to the widespread contamination of PCBs and their persistence in the environment, the proposed actions will not provide a quick solution to the PCBs problem in the Bay. Rather, the actions proposed in this TMDL should accelerate the natural recovery of the Bay from impairment due to PCBs.[204]

By deleting any mention of "reasonable assurances" in the current TMDL, RWQCB evades the issue without explanation.

J. RWQCB's Plan Does Not Make "More Stringent Load Allocations Practicable"; Therefore, The TMDL Is Defective

The Project Report focuses on "hot-spot" remediation as a primary action needed to ensure attainment of the sediment and fish targets,[205] and does not call for any reduction in point source wastewater discharges. Before RWQCB can adopt a "plan" to reduce PCB levels in

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202 Water Quality Guidance for the Great Lakes System Supplementary Information Document (emphasis added).

203 RWQCB considered a level of 111 ng/g in a prior draft TMDL report (n. 158, supra), and there is no explanation in the Project Report as to why this level, or any higher level, is not more appropriate.

204 Draft TMDL from files of Fred Hetzel (November 22, 2002) at 33.

205 See, supra, n. 47.

sediment "hot spots," it must demonstrate that the actions it is requiring are practicable. U.S. EPA regulations provide that "[i]f Best Management Practices (BMPs) or other nonpoint source pollution controls make *more stringent load allocations practicable, then wasteload allocations can be made less stringent*. Thus, the TMDL process provides for nonpoint source control tradeoffs."[206]

The Board's "plan" to reduce PCBs in sediment is not "practicable." As discussed in the technical comments above, remediating sediment "hot spots" will yield minimal benefits because of the relatively small PCB mass contained in the so-called "hot spots," and recontamination will undercut the goals of "hot-spot" remediation. It therefore is unlikely that "hot-spot" remediation will result in significant reductions in the PCB levels in SFB. Moreover, sediments are not a major local source of PCBs in fish. Thus, an implementation plan that focuses on "hot-spot" remediation may not result in significant declines in species of fish receiving PCBs through the water column.

Moreover, RWQCB's proposal to assign a "less stringent" wasteload allocation to POTWs may be improper. RWQCB admits that discharges from POTWs with secondary treatment have an average PCBs concentration of 3,600 pg/L.[207] Mussel Watch studies show that PCBs are bioaccumulating in fish near POTW outfalls, and that outfalls are directly contributing to the contaminant load available for bioaccumulation.[208] Drs. Connolly and Benaman have further found that fish receive PCBs from the water column.[209] RWQCB should explain why it is not requiring a numeric load reduction for POTWs.[210]

K. RWQCB Has Not Adequately Analyzed The Potential Environmental Effects Of The Proposed TMDL And Implementation Measures

1. RWQCB Appears To Have Pre-Selected An Alternative Prior To CEQA

RWQCB may have pre-selected a preferred alternative with an incorrect bias on mass removal of PCBs from sediment, without any indication that its decision was informed by CEQA. Though RWQCB has been working on the TMDL for several years, it characterized the February 10, 2004 scoping meeting as the "kickoff" of the CEQA process.

CEQA demands that "at the earliest feasible time, project sponsors shall incorporate environmental considerations into project conceptualization, design, and

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206 40 C.F.R. § 130.2(i) (emphasis added).

207 Project Report at 35.

208 See Bioaccumulation of Contaminants by Transplanted Bivalves in the San Francisco Estuary: Status and Trends (May 1996) (PCB concentrations ranged between 43.7 and 108.1 ppb, 74 and 214 ppb, and 77 and 169 ppb at three major estuary sewage outfalls; at one of the outfalls concentrations were always highest at the "near" outfall station than at the other gradient stations, suggesting a "near-outfall" source).

209 Tab B (QEA Expert Report) at 20.

210 Project Report, Table 27.

planning."[211] CEQA admonishes agency action that would preclude consideration of reasonable project alternatives ("public agencies shall not undertake actions concerning the proposed public project that would have a significant adverse effect or limit the choice of alternatives or mitigation measures before completion of CEQA compliance."[212]; "agencies shall not . . . take any action which gives impetus to a planned or foreseeable project in a manner that forecloses alternatives or mitigation measures that would ordinarily be part of CEQA review…."[213]).

Agency records show that RWQCB has been planning a sediment target, and an implementation focus on mass removal of PCBs from sediment, for several years. However, there is little indication that RWQCB considered alternative approaches. RWQCB's inflexible focus on sediment PCBs and mass removal indicates a preconceived plan.

2. Project Description/Baseline Conditions

CEQA requires RWQCB to include a description of the proposed activity, including a characterization of existing baseline conditions.[214]

a. Baseline Conditions

RWQCB is required to analyze potentially significant effects the project may have on the environment.[215] RWQCB cannot make a meaningful assessment of the potential environmental effects (i.e., any benefits and adverse impacts) of a PCB TMDL without first characterizing the baseline environment.

RWQCB also must explore alternative methodologies for determining baseline conditions rather than simply relying on one approach (i.e., the "one-box model"), while dismissing other approaches that have been brought to its attention during the TMDL process. As one court stated, "[i]f an EIR presents alternative methodologies for determining a baseline condition . . . we believe CEQA requires that each alternative be supported by reasoned analysis and evidence in the record so that the decision of the agency is an informed one."[216] Our April 25, 2003 letter to Tom Mumley of RWQCB urged RWQCB to correct its one-box model to account for the influence of tides in the Bay, but the Project Report does not indicate that RWQCB has analyzed this alternative for assessing baseline natural recovery processes.

Our February 9, 2004 letter to RWQCB raised a number of questions about the apparent inadequacy of RWQCB's characterization of baseline conditions. There are other concerns. As a general matter, RWQCB must apply better quality control procedures and

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211 CEQA Guidelines § 15004(b)(1).

212 CEQA Guidelines § 15004(b)(2).

213 CEQA Guidelines § 15004(b)(2)(B).

214 See, e.g., CEQA Guidelines § 15252(a).

215 CEQA Guidelines § 15252(b).

216 Save Our Peninsula Committee v. Monterey County Board of Supervisors, 87 Cal. App. 4th 99 (2001).

augment data gaps before proposing the TMDL. The Project Report makes use of various studies conducted by different entities, for different purposes, and using different parameters. RWQCB cannot describe baseline conditions adequately until it has consistent, reliable scientific studies to support its conclusions.

The Project Report does not adequately consider the factors affecting the baseline condition of the Bay, and places disproportionate focus on the impacts due to PCBs in sediments. SFB has been subject to numerous non-contaminant factors contributing to baseline, including a 79% loss in tidal marsh habitat during the last 200 years, and "the loss of these habitats accounts for most of the decline in ecological function of the tidal marsh . . . habitat losses have undoubtedly contributed to population decline."[217] The benthic ecology has also been impacted by introduction of exotic species. Alleged impacts to the benthic community due to PCBs cannot be examined without consideration of these and other factors. According to Dr. Jenkins, "[a] more extensive discussion of the current baseline condition, the factors that are most responsible for contributing to that baseline condition, and the critical factors that will limit or regulate the future enhancement of ecological resources in San Francisco Bay should, therefore, be included in the Problem Statement and Impairment sections of the PCB TMDL."[218]

The Project Report asserts that the Central Valley sources "contribute[] a significant PCBs mass to the Bay,"[219] but then concludes that sediment PCB concentrations from Central Valley sources are lower than those of Bay sediments and may actually be improving the condition of the Bay. RWQCB pledges to "verify the significance of this source . . . as more information becomes available,"[220] indicating that RWQCB has not characterized baseline conditions, which it must do before assessing environmental impacts under CEQA.

b. Project Description

In characterizing the project, RWQCB must also describe those actions implicitly required in the realization of the project. RWQCB must "[d]escribe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation."[221] RWQCB has fallen short of meeting this requirement by proposing a TMDL and then not describing in any detail the measures "necessary for its implementation." The Project Report's "TMDL Implementation" section provides only vague generalizations as to how TMDL allocations will be achieved in each load category.

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217 *Baylands Ecosystem Habitat Goals*, San Francisco Bay Area Wetlands Ecosystem Goals Project Report (Goals Project, 1999).

218 Tab C at 3.

219 Project Report at 61.

220 Id.

221 CEQA Guidelines, Appendix G.

- The contribution of atmospheric deposition to PCB loads is summarily dismissed from the project description; RWQCB only "encourage[s] further studies" to confirm its significance.[222]

- RWQCB suggests that load from in-Bay dredged material disposal is to be reduced from 12.4 kg/yr to 1.4 kg/yr. The report conservatively estimates current annual dredging volumes disposed in-Bay to be 2.1 million cubic yards/year. It acknowledges that even if voluntary reductions are made under the LTMS program, the annual volume of dredged materials disposed in-Bay will decrease by about 50% (from 2.1 mm cubic yards/year to 1 mm cubic yards/year). Assuming that this reduced the annual load from this source by 50% (from 12.4 kg/yr to 6.2 kg/yr), RWQCB must still account for the approximately 4.6 kg/yr load reduction it hopes to achieve.

- RWQCB suggests that dredged materials with PCB concentrations greater than ambient sediment should not be disposed at in-Bay disposal sites, and that it "expects" dredged materials represent ambient Bay conditions. It is not adequate for RWQCB to "expect" that dredged materials are representative of ambient conditions, or to ignore where dredged materials will be disposed.

- RWQCB concedes that Central Valley inputs are significant, asserts that a load reduction strategy "may be difficult to control," and then implies that by doing nothing Central Valley inputs may actually improve Bay ambient conditions.[223] To describe the "project" under CEQA, RWQCB must discuss Delta load reduction methodologies before dismissing them as infeasible.

- RWQCB indicates in-Bay sediment hot spots "will be remediated according to site-specific clean-up plans…."[224] without any suggestion of how "hot spots" will be remediated. If the active layer is removed, would this expose sediments with greater concentrations of PCBs? Will capping be necessary? Is capping feasible in the Bay lowlands? What are the effects of capping on the benthic community? If dredging is required, how will it be conducted? Where will dredged sediments be disposed? The project description is not adequate without a complete discussion of "hot spot" removal.

3. Alternatives Analysis

CEQA requires RWQCB to analyze alternatives to the proposed activity.[225] RWQCB must evaluate alternatives as to its methodology for establishing the TMDL, and its proposed implementation methods. In our February 9, 2004 letter, we presented numerous alternatives that RWQCB did not consider, including monitored natural attenuation with

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222 Id. at 61.

223 Id. at 61.

224 Id. at 62.

225 See, e.g., CEQA Guidelines § 15252(a).

institutional controls. In contrast, the Project Report contains no meaningful discussion of what alternatives RWQCB has considered to date. Rather, it presents a single approach with targets and load reductions for certain sources of PCBs. RWQCB needs to articulate and characterize a range of alternatives sufficient to satisfy CEQA, and must do so in a timely fashion in order to give the public time to respond. See, e.g., Save Our Peninsula Committee v. Monterey County Bd. of Supervisors, 87 Cal. App. 4th 99, 120 (2001) ("[T]he EIR must set forth any analysis of alternative methodologies early enough in the environmental review process to allow for public comment and response. This is particularly important in a case such as this, where water issues were a matter of widespread public concern….").

4. Impacts Analysis

CEQA requires RWQCB to include a discussion of any significant or potentially significant adverse effects on the environment as well as mitigation measures proposed to avoid or reduce such effects.[226] With a proposed sediment target of 2.5 ppb, virtually the entire Bay floor exceeds the target. Sediment soils from routine, maintenance dredging necessary for navigation would exceed the 2.5 target. Where will these sediments be disposed? Will treatment be necessary? Will projects that require reuse of sediments such as redevelopment projects or wetland restoration projects be jeopardized? The report does not address any of the myriad potentially adverse environmental impacts that may result if the TMDL is implemented. Following are some significant impacts that RWQCB must analyze:

a. Land Use and Planning

The loss of tidal marsh habitat and baylands "are among the primary causes of ecological change in San Francisco Bay over the past 70 years."[227] If these diminished resources are to be restored to facilitate recovery of the ecological community, sediments must be used. Since virtually all Bay sediments exceed the sediment target, these restoration projects would be more difficult, and some even jeopardized, by the TMDL. Will sediments have to be treated before they can be used for restoration? CEQA requires analysis of the potential impacts of competing environmental goals such as tidal zone restoration.[228]

In 2000, the Bay Conservation and Development Commission ("BCDC") adopted a Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Area ("LTMS Program"). The development of the LTMS Program was a multi-agency effort with the participation of RWQCB and oversight by the SWRCB. RWQCB's proposed TMDL casts serious doubt on the successful implementation of the LTMS Program.

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226 See, e.g., CEQA Guidelines § 15252(b).

227 Tab C (Expert Report of Dr. Jenkins).

228 The CEQA Checklist inquires whether there is, "Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project . . . adopted for the purpose of avoiding or mitigating an environmental effect." CEQA Guidelines, Appendix G.

The Bay averages less than 20 feet deep, while modern ships often draw in excess of 35 feet. Extensive dredging is required to maintain the navigational channels vital to the economy of the Bay. Dredging of an estimated 2 to 10 million cubic yards per year is necessary to sustain maritime-related economy estimated to be over $7.5 billion annually. In addition, the LTMS contemplates several new public works projects to increase ship access in the Bay. Maintenance dredging results in a large volumes of sediment that must be disposed, mostly at in-bay locations. However, capacity at in-Bay and upland disposal facilities is limited.

Because of these capacity constraints, the LTMS Program seeks to limit dredging and the volume of sediments that must be disposed. One goal of the LTMS Program is to eliminate unnecessary dredging activities. If the proposed TMDL is adopted, alleged "hot spots" may be needlessly dredged in the absence of established ecological harm or human health risk. Another goal of the LTMS is to maximize reuse of dredged materials, both for habitat restoration and other development uses. If all dredged sediments are deemed to exceed PCB targets, sediments may not be available for reuse. Governmental bodies may be reluctant or refuse to use in-Bay sediments for habitat restoration or redevelopment activities out of concern over compliance with the proposed TMDL. The increased dredging from "hot spot" removals and the impediments created to beneficial reuses directly conflict with the stated goals of the LTMS Program.

These concerns are not hypothetical. Several million cubic yards from the Port of Oakland Deepening Project were used in the construction of an endangered species habitat at the Sonoma Baylands Wetlands Enhancement Project. Port of Oakland sediments were also used at the upland Galbraith site, which will be converted to recreational use (a golf course) following dewatering. A pilot project was recently performed for reusing dredged materials for levee maintenance and stabilization at Jersey Island in the Delta. Dredged materials have been beneficially reused for daily cover at the Redwood landfill. The potential impact to these and other potentially beneficial uses of Bay sediments must be analyzed under CEQA.

In addition to restoration and habitat conservation goals, the proposed TMDL may interfere with waterfront redevelopment activities. Expansion or redevelopment activities planned at the Rodeo, Benicia, Redwood City and Richmond ports, and the development of new ports at Vallejo and Selby, may be frustrated by the TMDL. The City of Richmond's plans for a multi-use redevelopment of the Kaiser shipbuilding facility may also be complicated due to the uncertain costs of contaminated sediments existing at the site or to be used as fill for the project.

The proposed TMDL may make most dredged sediments, even those from routine maintenance, unsuitable for disposal at in-Bay locations. This may increase capacity concerns at upland facilities, potentially "stealing" scarce landfill space allocated for placement of hazardous wastes. Upland facilities may need to alter landfill operations to accept and treat "hot spot" removals.

b. Impacts Associated With "Hot Spot" Dredging Activities

The report cites "hot spot" mass removal of PCBs as a primary mechanism for achieving TMDLs, but does not indicate whether RWQCB has performed any analysis of

adverse environmental impacts related to "hot spot" removal. There is a potential for both direct impacts to the aquatic environment and indirect impacts to the surrounding environment.

Mass removal activities will directly interfere with the existing environment. For example, any dredging of "hot spots" will resuspend various contaminants that are currently submerged and not bioavailable, including PCBs. The presence of resuspended sediments also affects other water quality parameters, such as turbidity, light penetration, and hardness. The excavation will counteract the positive effects of ongoing burial. Removal of top-layer sediments would expose sediments at depth for which testing has shown higher concentrations of PCBs, which may increase the bioavailability of PCBs. There is also the potential for undesirable, invasive species to be introduced into the marine environment if the active layer is removed.

The excavation, transport, and placement of "hot spot" sediments has the potential to result in significant noise impacts. The presence of large dredging machines in the Bay could degrade visual resources and cause other adverse aesthetic impacts. Several identified "hot spot" areas are in the vicinity of established recreational areas.[229] The impact to these recreational land uses must be analyzed.

c. Air Quality Impacts Associated With Dredging Activities

Removal of PCB-containing sediments from SFB may require use of diesel equipment to remove and transport the sediments, including dredges to bring the material to the surface, barges to transport the material to shore, hydraulic unloaders to transfer the sediment from barges to trucks, and diesel-powered trucks to transport the materials to upland disposal facilities. The emissions from these diesel sources would be substantial. Since racial minority and low-income populations experience higher than average exposures to air pollutants, and since the proposed activities may increase diesel emissions in such areas, environmental justice is a concern for the TMDL plan.[230]

The risk of exposure to diesel exhaust from RWQCB's proposed mass removal actions should be compared with the relative risk of in-place treatment options, including monitored natural attenuation with institutional controls. Bay Area residents can choose not to eat bottom-foraging fish, but cannot choose not to breath the air.

d. Potential Conflicts With Other Regulatory Efforts

Under CEQA, RWQCB is required to consult with all public agencies that have jurisdiction with respect to the proposed activity.[231] There are numerous regulatory programs potentially impacted by the proposed TMDL. Some, such as the State Implementation Plan

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229 Tab G (WSI Expert Report) 14.

230 See, e.g., Cal. Gov't Code § 65040.12; Cal. Pub. Res. Code §§ 72000 et seq., defining environmental justice and requiring Cal EPA to "[c]onduct its programs, policies, and activities" in manner that takes account of environmental justice concerns.

231 Cal. Pub. Res. Code § 21080.5(d)(2)(C).

under the Clean Air Act, the LTMS, and the various habitat conservation and restoration programs in the Bay, already have been discussed above. The proposed TMDL also is potentially inconsistent with other TMDLs for SFB such as the mercury TMDL, which does not preclude in-Bay disposal of mercury-containing sediments. As funding for water-related initiatives continues to decline,[232] RWQCB must consider the benefits of the proposed TMDL in light of the potential for disruption of other important governmental interests.

5. Performance Standards and Economic Impacts

Under Section 21159 of the Public Resources Code, when RWQCB adopts a performance standard, it must prepare an analysis of the reasonably foreseeable environmental impacts arising from the reasonably foreseeable methods of compliance with the standard, as well as an analysis of economic and technical considerations arising from the reasonably foreseeable methods of compliance with the standard. Section 21159 imposes a special burden on regulatory agencies to consider implications of the standards they intend to impose. The need to consider the methods of compliance with the TMDL standard, and the associated economic and technical ramifications, constitutes an important additional step RWQCB must take to satisfy its CEQA obligations. As discussed in our February 9, 2004 letter, RWQCB has provided no indication that it has conducted any analysis of the foreseeable methods of compliance with the proposed TMDL.

L. RWQCB Has Not Analyzed The Economic Impacts Of The Proposed TMDL

As described above and in our February 9, 2004 letter, RWQCB is required to analyze the economic impacts associated with the planned TMDL. This requirement derives from several sources, including provisions of the Porter-Cologne Act, the California APA, CEQA, guidance issued by Cal EPA and the SWRCB, and directives from the federal Office of Management and Budget. Our discussion above indicates the numerous potential economic impacts that may result from the proposed TMDL. Though the TMDL has been in development for many years, and has potentially enormous economic implications, the Project Report does not give any indication that any economic analysis has yet been performed.[233]

The requirement to perform economic analysis is not a perfunctory exercise. It is embedded in the first section of the Porter-Cologne Act, which states "activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those

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232 Tab G (WSI Expert Report) at 15, citing both Federal and State cuts to clean water programs.

233 In December 2003, Judge Peterson overturned the Regional Board's trash TMDL for similar reasons, finding that the Board (1) failed to conduct a cost-benefit analysis of the trash TMDL; (2) failed to consider economic impacts as required by state and federal law; (3) did not adequately analyze environmental impacts; and (4) failed to conduct assimilative capacity studies which might have shown that a trash "target" other than zero was appropriate. See Exhibit 11 (San Diego Superior Court, Case No. GIC 803631, Minute Order dated November 14, 2003).

waters and the total values involved, beneficial and detrimental, *economic* and social, tangible and intangible."[234] The legislative history of Porter-Cologne emphasizes that "[t]he regional boards must balance environmental characteristics, past, present, and future beneficial uses, and economic considerations (both the cost of providing treatment facilities and the economic value of development)."[235]

SWRCB has acknowledged that RWQCBs "cannot fulfill this duty [to consider economic impacts] simply by responding to economic information supplied by the regulated community."[236] RWQCB has an affirmative duty to consider economic objectives when adopting a TMDL and amending the Basin Plan.

We have asked Dr. William Desvousges to prepare an initial study of the potential economic impacts resulting from the proposed TMDL. His analysis in the attached expert report[237] provides a preliminary framework for analyzing the potential economic impacts of the proposed TMDL. This framework can be used by RWQCB as a means to develop the foundation for a proper economic analysis.

VI.

COMMENTS ON PROCEDURAL ISSUES

The TMDL should be conducted within a procedural framework that assures data quality, peer review, and review for consistency with regulatory reform initiated by Governor Schwarzenegger. These aspects are discussed in turn below.

A. RWQCB Should Comply With The Data Quality Act

In adopting the TMDL, RWQCB should comply with U.S. EPA's Data Quality Guidelines ("Guidelines").[238] The Guidelines apply to public dissemination of information, and are intended "to ensure and maximize the quality, including objectivity, utility and integrity of disseminated information."[239] The Guidelines mandate compliance with the following performance standards when information is disseminated:

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234 Cal. Water Code § 13000 (emphasis added).

235 Recommended Changes in Water Quality Control, Final Report of the Study Panel to the [State Water Board], Study Project – Water Quality Control Program, p. 13 (1969).

236 Exhibit 1 (1994 State Board Memo) at 4.

237 Tab F.

238 See Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by the Environmental Protection Agency. The Guidelines are adopted to comply with the Office of Management and Budget's ("OMB") guidelines pursuant to the Information Quality Act ("IQA"), P.L. 106-554, H.R. 5658, or "Data Quality Act."

239 Guidelines at 15.

- Disseminated information should adhere to a basic standard of quality, including objectivity, utility, and integrity.

- The principles of information quality should be integrated into each step of . . . development of information, including creation, collection, maintenance, and dissemination.

- Administrative mechanisms for correction should be flexible, appropriate to the nature and timeliness of the disseminated information, and incorporated into EPA's information resources management and administrative practices.[240]

"'Objectivity" focuses on whether the disseminated information is being presented in an accurate, clear, complete, and unbiased manner, and as a matter of substance, is accurate, reliable, and unbiased."[241] "'Utility' refers to the usefulness of the information to the intended users."[242] More rigorous requirements are applied to "influential" information. "Influential" means that the agency "can reasonably determine that dissemination of the information will have or does have a clear and substantial impact (i.e., potential change or effect) on important public policies or private sector decisions."[243] Certain classes of information are presumptively "influential," including information that supports top agency actions such as "rules, substantive notices, policy documents, studies, [and] guidance."[244] The Guidelines recognize that "influential scientific" information "should be subject to a higher degree of quality" than other types of disseminated information.[245] Specifically, the Guidelines indicate that "[a] higher degree of transparency about data and methods will facilitate the reproducibility of such information by qualified third parties, to an acceptable degree of imprecision."[246]

These Guidelines, including the more rigorous standard of quality applicable to "influential scientific information," should be used by RWQCB in developing its TMDL. In this instance, there are aspects of the TMDL that do not meet the applicable standards. Most significantly, RWQCB's one-box model which neglects the tidal flushing process that is primarily responsible for the ability of SFB to recover is not accurate and reliable as a matter of substance, which leads to inaccurate and biased predictions regarding the assimilative capacity of SFB, and SFB's ability to continue to naturally recover consistent with the decreasing trends shown by the Mussel Watch data. These errors are critical, as they fundamentally impact RWQCB's conclusions regarding the need for a TMDL in the first place, proposed load

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240 Id. at 3.

241 Id. at 15.

242 Id.

243 Id.

244 Id. at 20.

245 Id. at 20-21.

246 Id. at 21.

reductions and an effective implementation plan. It is noteworthy that RWQCB's model has not been validated. We believe any attempt to validate the model will reveal its fundamental defects and show that the model is not capable of generating results that reflect the true situation of natural recovery in the Bay.

B. RWQCB's TMDL Must Undergo Appropriate Scientific And Technical Peer Review

In recognition of the fact that "[i]ndependent, objective peer review has long been regarded as a critical element in ensuring the reliability of scientific analyses," the Office of Management and Budget ("OMB") has proposed peer review standards for scientific and technical information that significantly influences regulatory policies.[247] The Peer Review Guidelines supplement existing guidelines under the Data Quality Act by mandating peer review for all scientific and technical studies, reports and other data that form the basis for important policy judgments made in the context of agency directives, guidance, procedures and regulations. A peer review is defined as "a scientifically rigorous review and critique of a study's methods, results, and findings by others in the field with requisite training and expertise."[248]

As with the Data Quality Act, RWQCB would benefit from applying these guidelines. The Peer Review Guidelines require peer review for all "significant regulatory information" -- with a broad definition of "regulatory information" to include "any scientific or technical study that is relevant to regulatory policy."[249] Given this broad definition, these requirements should apply to RWQCB's Project Report, as well as any scientific and technical analyses prepared by others which RWQCB has relied upon or endorsed. It does not appear that RWQCB's TMDL, the model used to predict PCB mass loadings, the OEHHA fish consumption advisory, or the sediment and fish targets have gone through a valid peer-review process. We believe RWQCB would benefit from the input that could be provided through an independent, objective peer review,[250] and we encourage the agency to subject its Project Report to this useful mechanism in accordance with the Peer Review Guidelines.

C. RWQCB Must Cease Processing The Proposed TMDL Because It Is Subject To The Requirements Of Executive Order S-2-03

Executive Order S-2-03 issued on November 17, 2003, requires California agencies to cease processing any "proposed regulatory action," in order to provide time to analyze the proposed regulation's potentially adverse impacts on the economy and business

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247 See Proposed Bulletin Under Executive Order 12866 and Supplemental Information Quality Guidelines (August 29, 2003) (hereinafter "Peer Review Guidelines") at 2.

248 Id. at 1.

249 Id. at 9 ("'Regulatory information' means any scientific or technical study that is relevant to regulatory policy. Information is relevant to regulatory policy if it might be used by local, state, regional, federal and/or international regulatory bodies.").

250 See id. at 3 ("Independent peer review is especially important for information that is relevant to regulatory policies.").

interests. The PCB TMDL standard was "proposed" as a regulation in October 2002, when RWQCB presented its Staff Summary Report and Presentation at a Board meeting.

The Staff Summary Report proposed regulatory action in connection with the TMDL, and invited public comment on implementing its proposal. See Staff Summary Report ("We have made significant progress on this TMDL project and are preparing a Preliminary TMDL Project Report that reflects our efforts to date. This report provides a means for stakeholders to provide feedback on technical TMDL issues and development of an implementation strategy."); id. ("We are developing numeric targets for PCBs in fish tissue and sediment that will serve as the basis of the TMDL and load allocation scheme."). The Board's Presentation similarly states that the preliminary report "provides stakeholders the opportunity to comment on the technical aspects of the PCBs TMDL." It also lists "Proposed Numeric Targets for PCBs."

Because RWQCB was engaging prior to November 17, 2003 in regulatory action in connection with the TMDL, it was required to reassess the TMDL for impact on business by February 15, 2004. Rather than complying with this executive directive, RWQCB proceeded to "officially release" the Project Report on January 8, 2004. S-2-03 is particularly relevant to the proposed TMDL, as it potentially requires costly, substantial remedial efforts to meet the proposed target concentrations for sediments and fish, despite the absence of scientific evidence that such work is required to protect human health or the environment.

VII.

CONCLUSION

For all the foregoing reasons, we respectfully request that RWQCB stay the formal promulgation and implementation of the proposed TMDL. This would allow RWQCB and interested parties the time needed to conduct further investigation and work cooperatively to develop the foundation for a TMDL for PCBs in SFB that would be legally and scientifically sound, and capable of being implemented, without creating the host of unwarranted and potentially adverse direct and indirect environmental and economic impacts that this TMDL portends.

City of Palo Alto
Public Works Department

February 4, 2004

Fred Hetzel
Environmental Scientist
San Francisco Bay Regional Water Quality Control Board
1515 Clay St., Suite 1400
Oakland, CA 94612

Subject: Response to January 8, 2004 PCB TMDL Report

Dear Mr. Hetzel:

Divisions

Administration
650.329.2373
650.329.2299 fax

Engineering
650.329.2151
650.329.2299 fax

Environmental Compliance
650.329.2598
650.494.3531 fax

Equipment Management
650.496.6922
650.496.6958 fax

Facilities Management
650.496.6900
650.496.6958 fax

Operations
650.496.6974
650.852.9289 fax

Regional Water Quality Control
650.329.2598
650.494.3531 fax

The strategy for PCB reductions must be fundamentally revised from that proposed in the January 2004 Regional Board Report. Requiring a 90 percent reduction from urban storm water conveyance systems is infeasible. PCBs are widely distributed from decades of use and soil, air, and water contamination in hundreds of thousands of locations throughout the Bay Area. The ubiquitous nature of this legacy of environmental release makes clean-up an unrealistic strategy.

Even if clean up of these hundreds of thousands of sources was feasible or affordable, there is no certainty, or even likelihood that water quality objectives would be achieved. As the report points out, the bay sediments contain a massive reservoir of PCBs from the past which are now contributing directly to the water column and the food chain. Even if the 90 percent reduction were to be achieved from urban stormwater, we do not know whether a significant reduction in the water column or food chain would result.

Therefore a different approach must be pursued. We must:

1. Estimate the contribution (flux) from the bay sediment to the water column and food chain.
2. Estimate the rate of decrease of that flux over time (due to the discontinuance of PCB manufacture and flushing to the ocean.)
3. Make that flux reduction the backbone of our implementation strategy.
4. Add hot spot identification and remediation as an urban runoff program task; but without numeric commitments since we do not know what percentage of the PCBs are coming from hot spots where clean-up is feasible.

We appreciate this opportunity to comment on the PCB TMDL. If you have questions regarding this feedback, please contact me at (650) 329-2285 or via email at phil.bobel@cityofpaloalto.org.

Sincerely,

Phil Bobel
Manager, Environmental Compliance Division

P.O.Box 10250
Palo Alto, CA 94303

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Environmental Services Department
DIRECTOR'S OFFICE

February 20, 2004

Dr. Fred Hetzel
Environmental Scientist
San Francisco Bay Regional Water Quality Control Board
1515 Clay St., Suite 1400
Phone: (510) 622-2397
Fax: (510) 622-2460
E-mail: fh@rb2.swrcb.ca.gov

SUBJECT: Comments on Total Maximum Daily Load (TMDL) project report for PCBs in the San Francisco Bay

Dear Dr. Hetzel:

The City of San Jose (City) would like to thank you for the opportunity to submit comments on the TMDL project report for PCBs on behalf of the San José/Santa Clara Water Pollution Control Plant (Plant) and the City of San José Urban Runoff Program.

The Plant provides wastewater treatment services to the cities of San José and Santa Clara, and other cities and agencies within the tributary area. These include the City of Milpitas, West Valley Sanitary District (Cities of Campbell, Los Gatos, Monte Sereno and Saratoga), Burbank Sanitary District, Cupertino Sanitary District (City of Cupertino), Sunol Sanitary District, and County Sanitation Districts #2 and #3. The Plant service area includes approximately 1.4 million residents and over 16,000 businesses in Silicon Valley.

The City is a major provider of funding and technical support for studies to identify sources of PCBs as part of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and as a founding member of the Regional Monitoring Program (RMP) and a member of the Clean Estuary Partnership (CEP). The City strongly supports the San Francisco Bay Regional Water Quality Control Board's (Regional Board) adaptive management, phased approach to the PCB TMDL.

The City's main concerns with this report or proposed amendment are the data limitations and uncertainty relating to this TMDL effort, which make reasonable load allocation development

difficult. This TMDL effort necessitates development of a long-term regional plan to address PCBs and related uncertainties in a cost-effective manner. The TMDL should be based on the best available information and sound science, as well as appropriate cost-benefit analysis and affordability. In particular, the implementation actions must be consistent with the standard of "maximum extent practicable."

In addition, the City is concerned about the approach to POTWs that is reflected in this report or future proposed amendment. POTW contributions of PCBs are small and therefore additional requirements do not appear to be warranted.

The following are some additional comments or concerns regarding the project report.

Sediment Target Uncertainties:

- Different analytical methods used (**p 15-16**), making comparisons difficult.
- Uncertainty of estimate of ambient PCB mass in sediment due to limited data from 1992 core samples from two Bay locations. (**p 27-30**)
- Uncertainty in sediment budget.
- Uncertainty due to absence of completed food web model.

Recommendation: The report should quantify the range of uncertainty of estimates presented throughout the report. Although some uncertainties will be reduced with upcoming data from the RMP/USGS study on the Guadalupe River, a great deal of uncertainty will still remain. Activities related to reducing these uncertainties should be included in the implementation section. In addition, as suggested by BASMAA, the sediment target should be referred to as "preliminary sediment target" until these uncertainties can be reduced to a reasonable level.

Central Valley Input

- The Central Valley contributes a large mass of PCBs to the Bay according to the current estimates (although sediment concentrations from C.V. are low). The report includes load reductions from the Central Valley, but there are no actions required to meet this reduction and no information is presented to justify that this reduction is reasonable or expected.

Recommendation: The report needs to include a rationale for the reduction from the Central Valley and for not requiring implementation actions from the Central Valley at this time.

Sources and Loads

- Estimates of PCB loads from urban runoff conveyance systems were generated based on the results of studies that looked only at the concentrations of PCBs in bedded storm drain

sediment. This measure is adequate for comparing differences between land use types as was the intent of the Joint Storm Water Agency study, but inappropriate for estimating loads.

Recommendation: The Regional Board should not use this data to estimate loads. The report should clearly identify the process for adaptive management when new information becomes available and not require significant load reduction activities until the uncertainty levels have been reduced.

Models

There appear to be discrepancies in the mass budget model used.

- There appear to be discrepancies between loads and losses reported in the mass budget model on **pp. 49-50.** The mass budget model has Golden Gate Outflow as a reduction (negative load) along with degradation and burial of sorbed and particulate PCBs. However, losses from the Bay through the Golden Gate are not accounted for or quantified in the TMDL section of the report.
- At the top of **page 50**, the mass budget model estimates that external PCBs loads to the Bay over the last 20 years were between 0 and 20 kg annually. However, in the paragraph that follows the above estimated loads, when a PCBs mass of 2,500 kg in the active layer is assumed, estimated yearly loads rise to 80 kg/yr. The source of this estimate is unclear.

Recommendation: A thorough, multi-box sediment budget would benefit this and all other TMDLs for contaminants that are associated with sediment. Clarify the large discrepancy in the mass budget model estimates for yearly loads in the active layer and provide more information on the validity of the assumption of 2,500 kg PCBs in the active layer. Further, we suggest rewriting the discussion to include consideration of the possible values of active layer sediment loads presented in Table 24 (**p. 43**) of 1,400 kg, 3,100 kg and 4,900 kg.

TMDL Implementation – Load and Wasteload Allocation

- POTWs - The report acknowledges that the bioavailability of PCBs in wastewater may not be significant and proposes that dischargers undertake studies to evaluate localized bioavailability. The report also states that "we expect future expansion of water re-use programs because such programs not only result in conservation of water resources, but also result in reduced loads of PCBs to the Bay." It also lists five specific requirements to be incorporated into the NPDES permit for wastewater dischargers. The City objects to the assumption that these prescriptive activities need to be included in the NPDES permits. The Regional Board report states that POTW discharge is not a significant source and that no further reductions will be required yet there is this requirement to include potentially unnecessary pollution prevention activities into all dischargers' permits.

Recommendation: The TMDL should not make prescriptive pollution prevention or water reuse requirements part of the NPDES discharge permits for POTWs because they represent a "de minimis" contribution. Once the WLAs have been adopted, the Bay Area Clean Water Agencies (BACWA) could be asked to include PCB reduction activities into the Pollution Prevention Menus effort currently being developed for Bay Area dischargers. This regional effort provides a forum for identifying reasonable, effective activities for reducing various pollutants of concern.

In addition, it is unclear whether the Regional Board would include effluent limits for POTWs. If so, they must be consistent with the "de minimis" concept, and if mass limits are contemplated, they must recognize the potential for increases in flows from POTWs due to population and business growth.

- Urban Runoff – Prior to requiring any significant load reduction effort, the 2kg/year load allocation must be verified. The level of uncertainty for this load allocation is too great at this time to make the proposed load reductions defensible.

Recommendation: Address uncertainties prior to requiring additional load reduction activities and develop implementation actions consistent with "maximum extent practicable." As stated by BASMAA, the report should state that the load reductions and implementation actions for urban runoff dischargers are preliminary and contingent on an analysis of cost and feasibility.

Timeline

Recommendation: Work with stormwater agencies to develop an appropriate timeframe for implementation.

We incorporate by reference comments submitted by the Bay Area Stormwater Management Agencies Association (BASMAA). If you have any questions please contact Steven Osborn at 408-945-5303.

Sincerely,

Francis B. McCoy

Carl W. Mosher, Director
Environmental Services Department

Submitted via Fax transmission
February 20, 2004

Fred Hetzel, Ph.D.
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: **Comments on Regional Board staff report "PCBs in San Francisco Bay Total Maximum Daily Load (TMDL) Project Report"**

Dear Dr. Hetzel:

This letter is submitted by the City of Sunnyvale in response to the invitation to submit comments on the Regional Board staff report dated January 8, 2004 entitled *PCBs in San Francisco Bay Total Maximum Daily Load (TMDL) Project Report* (hereinafter referred to as the Staff Report). The City appreciates this opportunity to comment on the Staff Report and remains committed to addressing impairments to beneficial uses of San Francisco Bay Area water bodies impacted by urban runoff and POTW discharges.

The comments noted below are intended to be preliminary and constructive. We request that the suggested comments be addressed in a revised PCBs TMDL Project Report.

- The City participated in the development of the comments submitted to you by BASMAA on behalf of the Bay Area stormwater programs and concurs with their comments and recommendations. BASMAA's comments are incorporated by reference in this letter.

- The US EPA concept of "de minimis" needs to be addressed as part of the development of TMDLs, particularly as it applies to the implementation of load allocations and the prioritization and requirement of further actions. The "de minimis" concept clearly comes into play when the Regional Board determines the need for water quality based effluent limits as well as the need for allocating pollutant loads as part of a TMDL. EPA has utilized this concept as part of a number of environmental programs and thus, through its actions, has developed and provided applicable guidance. Further, other California Regional Board's have also considered and applied this concept (i.e., Santa Ana Regional Board Order No. 98-67). The Regional Board staff analysis contained in the subject report clearly indicates that municipal POTW sources are small and as such "zero" future load reductions are proposed. Thus, the argument to support the "de minimis" concept as it applies to municipal POTW sources has already been made.

- As the report is currently written, it is unclear if the Regional Board staff are recommending use of a total Bay Area PCB mass applied to all municipal POTW dischargers (see report Section 9.1), if individual effluent limits (concentration and/or mass) would be incorporated into individual permits (see report Section 8.1), or if both approaches would be utilized. The staff recommendation along with the proposed future implementation requirements to be placed in municipal POTW need to be consistent the "de minimis" concept.

- The text in Section 8.1 is unclear/vague relative to whether the TMDL Implementation will be approved prior to the Regional Board considering incorporation of such proposed TMDL implementation actions in municipal POTW permits. Consistent with the California Water Code, it is our understanding that the Basin Plan amendments relating to the PCB Implementation Plan must first be approved via the State's regulatory administrative process prior to incorporation of

such actions in POTW permits. Thus, we recommend that that Regional Board staff clarify that the Basin Plan amendments, including the implementation plan, need to be adopted consistent with the CWC prior to including any limits and/or actions in NPDES permits.

- The Regional Board staff appropriately recognizes the high level of POTW performance relative to the treatment of wastewater and thus the removal of pollutants such as PCBs. However, the report should recognize the existing high level of source control already provided by many, if not all, Bay Area POTWs per existing NPDES requirements. Source control and pretreatment programs, initiated as part of the U.S. EPA Clean Water grant program in the mid 1970's, have been a key element of all major and some minor POTW dischargers. In the mid 1980's and throughout the 1990's these programs have been expanded to include pollution prevention efforts. These programs are alive and well and function effectively to protect the POTW infrastructure from pollutants to maintain the high level of performance and to reduce pollutants of concern at the source and ultimately to minimize discharge to the environment. The addition of new demands on these ongoing programs is does not appear to be warranted.

- The Regional Board staff recognized that advanced treatment facilities perform better than secondary facilities relative to the removal of PCBs. However, it is unclear how the Regional Board proposes to provide credit to facilities for such proactive efforts.

- As stated above, it is unclear whether individual POTWs are to be given effluent limitations containing mass limits. If so, the TMDL should provide for gradual increases in flow in POTW discharges due to population and business growth. Failure to do so would place the POTWs in jeopardy of noncompliance for reasons entirely beyond their control, especially if they are advanced waste treatment systems that have already initiated source reduction and pollution prevention programs.

We recognize the difficult nature of the legacy water quality issue that the Regional Board must address and commend the Regional Board staff on the hard work put into prepare the subject document. Further, we would also like to recognize the staff and participants of the San Francisco Estuary Regional Monitoring Program for Trace Substances (RMP) and Clean Estuary Partnership (CEP) for their contributions to this effort.

Very Truly Yours

Marvin A. Rose

Marvin A. Rose, P.E.
City of Sunnyvale
Director of Public Works

February 20, 2004

CLEAN
WATER
FUND

Bruce Wolf, Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Oakland, CA 94612
Via mail and e-mail

Re: December 22nd, 2003 PCB TMDL Project Report

Dear Mr. Wolf:

Our organizations are working collaboratively to develop a community planning process for the Yosemite Creek Watershed. This watershed lies primarily in the Bayview Hunters Point neighborhood of San Francisco, a largely minority, low-income community that suffers disproportionately from pollution from both past and present industrial sources. Yosemite Creek and the northern portion of South Basin (Parcel E of the Hunters Point Shipyard) have been identified as hot spots for PCB contamination, and recently uncovered evidence indicates that an active source of PCB contamination remains in the Shipyard. Because of that, our organizations have been monitoring this TMDL process with great interest. We offer the following suggestions for improving the document and the implementation process.

Environmental Justice is ignored in this document. We are deeply concerned that this report discounts the severity of the threat to Bayview Hunters Point and other low-income and minority shoreline communities. For instance, on Page 22, the list of beneficial uses impaired by PCBs in the Bay does not include subsistence fishing. Subsistence fishing is a pathway for PCB exposure to vulnerable populations, particularly children and pregnant women. Our concern is rooted in experience; although several public agencies were aware of the extent of the PCB contamination in Yosemite Slough/South Basin, no signage was posted to alert the public until Arc Ecology, a project partner, lobbied the Department of Public Health last fall. The extent and location of shoreline PCB contamination is an immediate public health threat that is not seriously addressed in this document.

In addition to impacts on subsistence fishermen, there is no information or acknowledgement of the restricted use of the shoreline in these impacted areas. Children are seen playing in the area of Yosemite Slough – unfortunately, while playing in dirt or mud is a popular childhood pastime, it is a hazardous venture in neighborhoods such as this.

One of the goals of the Bayview Hunters Point community is the development of a park along the South Basin Shoreline, part of which is already being planned by State Parks. But neighbors are suspicious of the contamination in the area, and doubtful of the commitment of the responsible agencies to remove those toxics.

It is not the task of this report to quantify and mitigate all of the pollutants that impact this community. But we are asking that *this* document prioritize the removal of *this* pollutant from *this* community, and that the Board acknowledge its responsibility to lessen the burden on heavily impacted neighborhoods.

The 100-year timeline for Clean Water Act compliance is not sufficiently protective of human health. The recommendations of this report envision attainment of Clean Water Act standards beyond the lifetime of anyone making the rules. Yet the load allocations in this document propose only a 63% reduction in PCB loadings to the Bay. The threat to public health demands a greater commitment to reducing PCB loadings into the Bay as quickly as possible. We understand that the "adaptive implementation plan" proposed in this report is intended to provide additional guidance as more information is developed, but we argue that the most restrictive and health-protective allocations should be put in place now, and that adaptive management then be used to increase already strong protections.

The unchanged allocation for municipal wastewater dischargers is inadequate. Again, this is a PCB source that tends to impact minority communities. 80% of the sewage produced in San Francisco is treated at a plant in Bayview Hunters Point, and PCB contamination in both Islais Creek and Yosemite Slough can be at least partially attributed to sewage and stormwater overflows. Dischargers whose operations impact residential communities, and particularly low-income and communities of color, should be held to a higher standard in this report. The purpose of this document is to safeguard human health – and the enforcement of stricter load allocations on dischargers needs to be part of the equation. We recommend that load allocations be developed for specific dischargers, and that the allocation for such dischargers be reduced to as nearly zero as possible.

The load allocation from Central Valley sources is insufficient. This is the largest contributor of new PCB sediment contamination, yet bears little responsibility for reducing the load allocations to the Bay. This Board may not have direct regulatory oversight into the TMDL process of the Central Valley Regional Board, but they have a responsibility to advocate for a greater reduction with both the Central Valley Regional Board and the State Board. And communities in the Central Valley also deserve a health protective load allocation. We urge that

the Boards work together with the State Board to develop strong allocation goals for Central Valley sources.

This document provides inadequate oversight, regulation, and remediation of "hot spots". This report identifies elevated PCB levels in the tissue of fish located in known PCB hot spots. Yet no direct actions are proposed in this document to identify new or remediate existing hot spots, even though this could dramatically improve PCB levels in Bay fish, particularly in areas where subsistence fishing is common. This report's language describing and implementation measures for identifying and remediating hot spots must be strengthened.

We urge the Regional Board to use all the tools at its disposal to protect human health. Some suggestions are

- That the Regional Board oversee preparation of an inventory of both on-land and in-Bay hot spots at a specific, early date. This process needs to include a method for identifying new hot spots.
- That these hot spots be assessed and prioritized for cleanup according to their threat to human health and to heavily impacted communities.
- That the implementation plan provide details on recent, current and planned remediation processes.
- That the Regional Board spearhead a cooperative multi-agency process to quickly remediate those hot spots identified as having the most severe and immediate impact on human health and on disproportionately burdened communities. This process must also identify those parties responsible for the cleanup.
- That the Regional Board use an early hot spot remediation process as an opportunity to evaluate how reduction of sediment concentration affects the tissue concentration of nearby fish populations – and that this information be used to assess the assumptions of this TMDL.

Public review of current and future actions. We are concerned that the "adaptive implementation process" envisioned by this report will result in a lessening of public oversight. While we appreciate the need to be flexible, the lack of detail in this report makes us uneasy about the prospect that real change will occur through this process. What oversight will the public have of this "adaptive" process and the changes it makes in the implementation plan, as well as in the 100-year schedule for compliance? We would like to be kept informed of your hot spot assessment and remediation plans.

We urge the Board to develop a process to inform local communities of the implementation and remediation actions proposed in their area, and give the communities the opportunity to participate in monitoring activities. Empowering communities by giving them the tools to help themselves is a key goal of

environmental justice efforts, and we urge the Board to incorporate these tools to the greatest extent possible. We would be happy to share our experiences in community-based water quality monitoring.

We appreciate the opportunity to comment on this document, and hope to have the opportunity to participate in future discussions on the implementation of this TMDL.

Sincerely,

Jennifer Clary
Clean Water Fund

On behalf of

Dana Lanza
Literacy for Environmental Justice

Saul Bloom
Arc Ecology

Karen G. Pierce
Jeff Marmer
Alliance for a Clean Waterfront

Jack Lendvay
University of San Francisco

Bayview Hunters Point Community Advocates

Arthur Feinstein
Golden Gate Audubon Society

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser 3EN.WS/013
February 20, 2004

Mr. Fred Hetzel
San Francisco Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. Hetzel:

Please find attached our comments on the PCB TMDL Project Report. The Navy has a strong commitment spanning over twenty years to proactively work with state and federal regulatory agencies, local governments, nongovernmental organizations, and the public to remediate contaminated sites. Our goal has always been to conduct our program in a positive manner that emphasizes cleanup and protection of human health and the environment. In the context of the PCB TMDL, we are in active discussions at Hunters Point and Alameda Point to plan the CERCLA strategy for responding to PCB contaminated sediments.

Our primary concern with the proposed PCB TMDL is that it seems more geared towards establishing a theoretical baseline target that by the San Francisco Regional Water Quality Control Board's own public admission at the public workshop on February 10, 2004, is not achievable. As discussed in our comments, we feel much of this baseline relies on questionable assumptions and science. We are concerned that adoption of a 2.5 ppb target will not facilitate cleanup, but will instead result in protracted challenges and possibly litigation to establish alternative cleanup levels that are more realistic and attainable. Such challenges will not improve the environment and could delay needed cleanups and divert resources from other beneficial environmental projects. We believe the focus of the PCB development process should be on establishing a realistic target that is based on appropriate science and realistic assumptions.

We appreciate the opportunity to provide input in the PCB TMDL development process and look forward to continuing to work with the San Francisco Regional Water Quality Control Board. If you would like to discuss any of our comments further, please contact Mr. Michael Pound at (619) 532-2546.

Sincerely,

Walter F. Sandza
Installation Restoration Program Manager

Review of "PCBs in San Francisco Bay – Total Maximum Daily Loads"

Project Report, dated January 8, 2004.

INTRODUCTION

This memorandum is a review of the report "PCBs in San Francisco Bay: Total Maximum Daily Loads – Project Report", dated January 8, 2004. The process for developing a TMDL as defined in the report includes defining the impairment, identifying sources, quantifying loads, allocation of loads and implementation actions.

The document is an excellent first attempt for developing the TMDL but is not developed adequately enough or based upon enough defendable data to be implemented as a regulation. Each of the key elemental building blocks for developing the TMDL is oversimplified and based upon numerous assumptions such as; the amount of fish ingestion by Bay Area residents, the sediment transport mechanisms in the Bay, the link between fish tissue PCB concentrations and PCB sediment concentrations, and the current PCB loading to the Bay from the watershed as well as from in bay sediments.

Following are general comments that are organized within the major categories in the project report: Impairment Assessment, TMDL Development and TMDL Implementation. The general comments are followed by detailed comments.

GENERAL COMMENTS

Impairment Assessment

The baseline assessment of the bay as described in the Problem Statement section of the Project Report is based upon too little data making it difficult to assess the actual ecological or human health implications of the present PCB concentrations in the water, sediments and fish tissue. Without an accurate assessment of the current conditions, any imposed allocations or targets lack a reference point from which to gage improvement.

1. ***Fish Tissue:*** The Project Report states that all segments of the San Francisco Bay were initially placed on the 303 (d) List for PCBs due to an interim fish consumption health advisory issued in 1994. This advisory was issued by the Office of Environmental Health Hazard Assessment (OEHHA) and based upon PCB concentrations in fish tissue collected in 1994 that may cause a detrimental human health effect. However the fish tissue levels are below levels considered safe by the federal Food and Drug Administration and the advisory remains under consideration by OEHHA.

   The approach the RWQCB used for defining a fish tissue target (cancer slope factor approach) is *one of several methods* that can be used to establish fish tissue screening levels, and there is significant debate in the scientific community about the appropriateness of this method. Most important, this approach does not adequately

account for PCB composition. Aroclors 1254 and 1248, for instance, are widely considered as the Aroclors with the highest "potency", with a greater proportion of the dioxin-like congeners. An Aroclor 1254 based risk will significantly over estimate the potential risk in most biological and marine systems.

In addition, once released into the environment, Aroclors mix, undergo environmental weathering and other transformation processes thereby further changing their composition. It is therefore important to ensure that the method used to establish and monitor a screening level appropriately considers the composition, and risk of the actual PCB contamination from exposure to the various environmental media (tissue, sediment, water). This analysis is lacking in the Project Report.

2. ***Sediment:*** The document extrapolated the PCB data from a limited set of sediment core samples in Richardson and San Pablo Bay to the entire San Francisco bay and estimated a total PCB mass in ambient sediments. PCB sediments are far too variable to make such a gross generalized estimate for total sediment PCB mass. The relative significance of "hot spots" should be bettered determined and described, as well. The report suggests that most of the PCB's in the Bay can be attributed to a few "hot spots." Understanding the PCB distribution and relative significance of inputs is critical before developing targets, loads and allocations.

TMDL Targets

The fish tissue and sediment targets that are proposed are based on assumptions that have not been sufficiently substantiated. As discuss previously defining a fish tissue target can be accomplished by numerous methods. Other methods should be included in the document or an explanation why the method used was chosen. Defining a sediment target for the San Francisco Bay is especially premature considering the State Water Resource Control Board is in the process of developing Sediment Quality Objectives. The Sediment Quality Objectives are scheduled for release in August 2005 and it is not practical to publish a sediment target prior to the Sediment Objectives being developed and released by the SWRCB.

Mass Budget Model for the determination of the Waste Load Allocation

The mass budget model oversimplifies the spatial and temporal variability in the S.F. Bay. For example, contaminant transports models typically treat bioturbation and sediment transport as completely different flux processes that vary spatially throughout most systems. Each of these parameters is highly variable in the Bay. Therefore, the model's reliance on a single mechanism (i.e. the active layer) to define the PCB mass available for exposure will yield multiple inaccuracies through much of the bay, as over and underestimations.

Bioturbation is typically observed as a continuous property with high activity at the surface dropping off with depth due to variation in biological density. Therefore, when modeling, it is generally best described as a continuous diffusive process that decreases with depth instead of a single well-mixed layer.

Lastly, the sediment available for transport for any given site within the bay also depends on hydrodynamic conditions. Modeling this as a single active layer of sediments available for erosion bay wide (as performed for the project report) could result in significant over or under estimation of hot spot PCB exposure.

Implementation

As stated earlier, the implementation process is not developed in the document and requires further investigation and consideration of a variety of alternatives. The report states that in bay PCBs contaminated sediments will be remediated according to site specific clean up plans. The report should include an evaluation and discussion of the methods for remediation such as capping and monitored natural recovery.

SPECIFIC COMMENTS

1. Section 1 (first paragraph) and Section 1.3 (second paragraph). The fact that the Bay functions as the only drainage outlet for water of the Central Valley and much of the state is an important fact in the entire TMDL process, and the complications associated with this are not well covered in the report. For instance, consideration of the relative significance of short- and long-distance input/transport of PCBs and how PCB input from this entire area be reduced and controlled should be included. The fact that much of the Central Valley PCB will be associated with progressively cleaner sediments does not change the fact that the Valley will contribute a significant mass of PCB that will be available for re-distribution to other environmental compartments (the river sediments will mostly have low organic content, and will not bind PCBs well).

2. Section 1.1 (second paragraph). The report's assumption that the Bay will recover uniformly is an oversimplification considering the variable sediment deposition and resuspension characteristics, and different current regimes.

3. Section 1.1 (first paragraph), Section 1.2 (fourth paragraph), Section 1.4 (paragraph 5), Section 1.7. It is clear that there is a need to better understanding of the sediment transport and organic carbon fluxes in the Bay, and also into the Bay from distant sources to understand the distribution and fate of PCBs. These data should be generated to understand the current PCB contamination situation in the Bay and model/predict future changes due to any actions directed at reducing the PCB. The data should be used to understand what recovery can be expected from different PCB control measures, and what is achievable. This should be done *before* establishing firm TMDL target levels.

4. Section 1.4 (paragraph 4), Section 1.5 (paragraph 2 and 3), and Section 1.7. The PCB contaminant relationship between sediment, water, and biota is not well described in the report, and needs more study. These relationships need to be well understood and communicated. For instance, the relationship between current and new sediment as sources of PCB in the water column and the biota must be understood. An evaluation of whether the water column concentration will be reduced by reducing/eliminating freshwater input alone should be included. And, the proportion of the PCB in different biota that can be directly attributed to sediment PCB concentrations and to water column concentrations must be defined.

5. Section 2.3 (section 7). The amount and distribution of PCB that may enter the Bay from different sources is not well accounted for or documented. Unreported users likely exist, and large amounts are likely present in other land areas that drain into the Bay. The TMDL process should take into account the total amount of PCB estimated to be present in potential point-sources within the entire drainage area, how is it distributed, and how it impacts the PCB control. In addition, the amount of PCB in non-point sources that will likely remain active chronic sources should be considered.

6. Section 2.4 (first paragraph). The statement that low-level PCB congener analysis can have poor precision and are relatively expensive appears to be based on one investigation, and is inadequately described. Poor precision can be obtained with any method, if not performed properly, and is not inherent to any particular analysis. The definition of "low-level" should be quantified, and whether this statement refers to a specific and unique sampling and analytical approach. Congener methods are preferred for water analysis; Aroclor methods are particularly poor for water samples because of the water solubility and particle adsorption varies greatly for different PCB congeners (i.e., Aroclor patterns are rarely maintained in a water samples).

7. Section 2.4 (second paragraph). It is recommended that a consistent congener list and appropriate analytical methods be used for the tissue and sediment monitoring, to ensure data quality and comparability. The concentrations of the NOAA 18 congeners (third bullet) have been converted to a total PCB concentration (not total Aroclor, although the value should be the same) in various data comparisons (Figure 3). These studies have shown that the sum of the 18 congener concentrations multiplied by X-Y (presented by the X and Y values added to the document) approximate the total PCB in most US coastal sediments; a multiplication factor of 2 is widely used.

8. The basis and appropriateness of the 170 pg/L water quality criteria should be carefully reviewed and better supported. The criterion should specify if it applies to the PCB in the dissolved phase (e.g., passes a 0.7 or 1 µm filter), particulate phase (e.g., is captured on a 0.7 or 1 µm filter), or total (combined dissolved and particulate phase), and the rational for choosing that sample media. PCBs distribute between the dissolved and particulate phase depending on factors such as log K_{ow} of the PCB, the size and form of the particles, the amount and form of organic matter in the water column and sediment, etc. This phase distribution is critical to determining the bioavailability and potential environmental risk of the PCB. The lower molecular weight PCB congeners tend to be relatively more associated with the dissolved phase, and the higher molecular weight congeners with the particulate phase (REF). The PCB in the dissolved phase are significantly more bioavailable to biota than particle associated PCB, and the dissolved phase PCB should primarily be considered for BCF considerations.

   The BCF approach for the log Kow value of the PCB (REF) heavily influences developing standard and inappropriate water-based standards may result if not fully considered. The tetra- to hepta- chlorobiphenyl congeners that dominate most common PCB contamination (e.g., Aroclor 1242, 1254, and 1260 type PCB) have BCF for biota that increase with level of chlorination (and Aroclor number), and differ by more than a factor of 10. The higher molecular weight congeners tend to "drive" the BCF analysis for

most common PCB assessments. However, these congeners are also substantially less water soluble, and if the standard is to be applied to PCB dissolved in the water column the BCF and associated criteria should be determined based on the PCB composition likely to be found in the dissolved phase. This would be dominated by the less chlorinated congeners – the congeners with much lower BCF – and those that are widely recognized to be of less environmental concern; the standard would then likely be set substantially higher.

9. Section 4 (second paragraph). It is stated that individual PCB congeners have widely varying potency for producing adverse effects. This is true, and the difference between different congeners and even Aroclor formulations are orders of magnitude (REF). It is therefore critical that the TMDL process incorporates this understanding and not base limits and criteria strictly on a generic total PCB value; the PCB congener composition, together with the concentration, determines the risk.

10. Section 5.2 (Central Valley Inputs). The Central Valley likely contributes large amounts of PCB, and the listed amounts are likely underestimates, as the TMDL report indicates. However, the statements found throughout the report that the PCB coming from the Central Valley is mostly sediment-sorbed and may contribute to "cleaning" the Bay sediments is not supported. The PCB may indeed mostly be particle-adsorbed in the River waters entering the Bay, just like most of the PCB in the rest of the water column of the Bay. However, no dissolved vs. particulate phase PCB data are provided in the report. The higher molecular weight PCB congeners are mostly associated with particles, but the lower molecular weight congeners may be dissolved. In addition, the sediments in the River are likely of low TOC content and therefore do not adsorb PCB well; a greater proportion would then be in the dissolved phase than with suspended matter that has a higher organic content. In addition, loosely adsorbed (or dissolved) PCB entering the Bay from the rivers are available to be distributed throughout the Bay, and are readily taken up by fish from the water column.

11. Section 5.3 (third paragraph). Different Bay sediment PCB concentrations are given in this document as "representative" concentrations, but the source of the data is not provided and it is not clear if the concentration is for surface sediment (e.g., top 2 cm) or an average over a certain depth (e.g., top 15 cm). This is important information that should be clarified to ensure consistency and appropriate application. For instance, is the 10 µg/kg a Bay-wide average total PCB concentration for the top 15 cm? If so, what data were used to calculate that and ensure that it is representative of the Bay as a whole?

12. Section 7 (fourth paragraph). The case for prioritizing the implementation processes as indicated has not been sufficiently established; a great deal of uncertainty remains in some of the mass loading estimations, as previously discussed. Also, the major mechanism for PCB uptake by fish may be foraging on bottom dwelling organisms, but direct filtering from the water column may also be significant. The PCB fate/transport information has not been presented convincingly, and is not well supported by references or data.

13. Section 8 (Table 27, and text). It is premature to set a TMDL of 31 kg/yr, and allocate the PCB loads as indicated in Table 27. The basis for this TMDL value and the relative

allocation is not supported; it is not clear that these PCB loads will achieve the desired goals. Statements based on the one-box model are included here, and should be replaced with reliable predictions.

14. Section 8.4. The relationship between the water quality standard, the sediment screening target, and the tissue target needs to be defined and understood. The question remains whether sufficient improvement will be realized once the water concentrations reach the water quality standard, regardless of sediment and tissue levels. Conversely, will sufficient improvement have been realized if tissue screening levels are reached, regardless of sediment and tissue levels? If so, how would this impact the TMDL process at the time when the satisfactory condition is reached in any one of these parameters?

15. Section 9.1 (Wastewater Discharges). There is no reason to believe that the bioavailability of PCBs in wastewater would be significantly different from other point and non-point sources, particularly since it will mix with the Bay water. There is therefore no reason to discuss bioavailability specifically under Wastewater Discharges, although it is an important consideration in the TMDL process as a whole (and particularly for sediments).

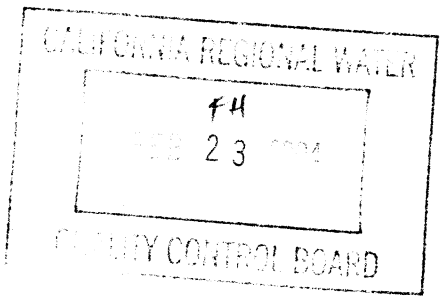
16. Section 9.1 (Urban Runoff). Logical steps are described for the implementation strategy for controlling urban runoff. However, a much better understanding is needed of today's PCB loads from urban runoff including non-NPDES permitted contributions, sources, and the distribution in the sediments contributing the PCB.

17. Section 9.1 (Central Valley Inputs). The assumption that the PCBs are totally associated with suspended sediments and will, for the most part, contribute to "cleaning" the Bay should be carefully considered. Central Valley inputs may indeed be difficult to control, but their relative significance may be greatly underestimated in this report.

18. Section 10 (Model Improvements). It is clear that significant refinements need to be made to the existing mass balance model. The current TMDL report includes assumptions based on a weak model, and the confidence in the modeling must be increased and the information in the TMDL report updated.

EAST BAY
MUNICIPAL UTILITY DISTRICT

DAVID R. WILLIAMS
DIRECTOR OF WASTEWATER



February 20, 2004

Mr. Fred Hetzel
San Francisco Regional Water
Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. Hetzel:

RE: East Bay Municipal Utility District Comments on PCBs in San Francisco Bay, Total Maximum Daily Load (TMDL) Project Report

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the San Francisco Regional Water Quality Control Board's (RWQCB) proposed TMDL project report for PCBs in San Francisco Bay. We would like to commend the San Francisco RWQCB and its staff for putting together a very good first draft for the PCBs TMDL. PCBs are not easy pollutants to address and the RWQCB has made good efforts to recognize the complexity of the situation and address such complexities appropriately.

While recognizing the challenge with preparing the PCBs TMDL, EBMUD submits the following comments on the PCBs TMDL Project Report dated January 8, 2004.

Targets

EBMUD supports the RWQCB's decision to not use the California Toxics Rule numeric criterion for water concentration as the target, or for setting the targets, for the PCBs TMDL. It would be inappropriate to use the CTR numeric criterion since there is no established relationship between PCBs levels in fish tissue and PCBs in water.

However, with regard to the sediment target, EBMUD is concerned that this target is premature in light of the State Water Resources Control Board's (SWRCB) current process for developing sediment quality objectives. The development of a sediment target or objective for PCBs is a very time intensive and complex undertaking, which is why the SWRCB has embarked on a multi-year process and schedule. The sediment target as calculated in the project report is based on many assumptions that may or may not hold true. To provide more scientific certainty, the RWQCB should postpone the establishment of a sediment target until the SWRCB has completed its process for the development of a sediment quality objective. At the very least, the RWQCB should characterize the sediment target as an interim measure until the SWRCB process is complete.

P.O. BOX 24055 . OAKLAND . CA 94623-1055 . (510) 287-1405

Linkage Analysis

BACWA supports the use of models to predict the long-term fate of PCBs in the Bay and to determine the TMDLs necessary to protect and attain beneficial uses. However, BACWA is concerned that the simplicity of the mass budget model as used by the RWQCB in this case is not appropriate for the highly diverse San Francisco Bay. Instead of relying on the over-simplified mass budget model at this time, BACWA encourages the RWQCB to wait until the more sophisticated model as is being prepared by the United States Geological Survey and the Regional Monitoring Program is complete.

Wasteload Allocations

As drafted by the RWQCB, the PCBs TMDL recognizes that NPDES permitted facilities discharge a small fraction of the total PCBs load to the Bay, and in general operate at a high level of performance. While the TMDL recognizes the minor input from wastewater discharges, it limits the wasteload allocations to no more than the current combined annual loads of 2.3 kg/yr for municipal wastewater discharges. The 2.3 kg/yr wasteload does not account for future growth that is expected to occur throughout the Bay Area.

Instead of limiting the wasteload allocation to the current load, EBMUD supports the development of a wasteload allocation that allows for minor increments of PCBs to account for increased flows. The San Francisco Bay Mercury TMDL allows for such changes in the mercury wasteload allocations and should be used as a model.

In closing, EBMUD appreciates the opportunity to comment on the PCBs TMDL Project Report and looks forward to working with the RWQCB to further improve the report and its application to the San Francisco Bay.

Sincerely,

David R. Williams

David R. Williams

DRW:MAB:mab

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LATHAM & WATKINS LLP

February 9, 2004

ALSO SUBMITTED VIA ELECTRONIC MAIL

Mr. Thomas Mumley
Division Chief, Planning and TMDL
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
(510) 622-2300

Re: Public Workshop and CEQA Scoping Meeting—San Francisco Bay PCBs TMDL Project and Proposed Basin Plan Amendment

Dear Mr. Mumley:

This letter is submitted to the California Regional Water Quality Control Board, San Francisco Bay Region ("RWQCB") in response to the agency's notice regarding the above-referenced meeting, to be held on February 10, 2004. At the meeting, RWQCB proposes to provide an overview of the agency's January 8, 2004 report entitled, "PCBs in San Francisco Bay: Total Maximum Daily Load Project Report" ("Report"), and to initiate a scoping process under the California Environmental Quality Act[1] ("CEQA"). RWQCB intends to incorporate the Report as an amendment (the "Amendment") to the San Francisco Bay Basin Plan, a process which requires compliance with CEQA. This letter contains our initial comments and discussion questions with regard to the scope and content of the environmental document that RWQCB must prepare for the Amendment pursuant to CEQA.[2]

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1 Cal. Pub. Res. Code §§ 21000 et seq.

2 These comments do not constitute an inclusive list of our comments on the agency's CEQA process for the proposed Amendment. We will expand on these comments and raise additional issues, as appropriate, at the future administrative proceedings that RWQCB has indicated it will undertake. These comments are submitted without any waiver of our right and/or opportunity to make additional comments in the future, and with a specific reservation with respect to such comments. Given the magnitude of

As you will recall, Latham & Watkins already has participated in the TMDL proceedings. For example, on the basis of expert analysis submitted to RWQCB by letter dated April 25, 2003, we urged RWQCB to correct its natural recovery model to account for the fact that San Francisco Bay ("Bay") is an estuary – not a lake as represented in the model. However, the January 8 Report does not appear to account for the influence of tides in the Bay, underestimating the ability of the Bay to recover naturally, and significantly overestimating the persistence of PCBs in Bay sediments. As the member of the State Water Resources Control Board's Sediment Quality Objectives task force representing issues regarding legacy compounds like PCBs, I find this overemphasis on sediments troubling, and one of many reasons why a probing and comprehensive CEQA analysis is critical in this instance.

I. CEQA's Applicability to the RWQCB Action

Because the basin planning process by which RWQCB proposes to add the TMDL to the Basin Plan is a "certified regulatory program," certified by the California Secretary of Resources, RWQCB must produce a document that is "functionally equivalent" to an Environmental Impact Report ("EIR") – but not an EIR per se. Lead agencies following CEQA under a "certified regulatory program" are exempted only from Chapters 3 and 4 (EIR contents/process), and Section 21167 (time period for CEQA challenges, replaced by Section 21080.5(g) for certified regulatory programs) of CEQA; such lead agencies must comply with all other CEQA provisions. Among other things, the functionally equivalent document ("FED") prepared by RWQCB must analyze alternatives, identify potentially significant adverse environmental impacts, and make findings as to how identified environmental impacts will be mitigated. Courts have held that cumulative impacts must be examined in a FED, which in this case include the environmental and economic impacts that may result from compliance with the Amendment.

In addition, when RWQCB proposes to promulgate performance standards like those contained in the draft TMDL, Section 21159 of the Public Resources Code applies. Section 21159 requires RWQCB to consider the environmental and economic impacts of the reasonably foreseeable methods of compliance with adopted performance standards. The State Water Resources Control Board acknowledges the obligation to consider economic impacts when establishing performance standards under a TMDL.

II. Discussion Questions and Comments

A. Project Description/Baseline Conditions

CEQA requires RWQCB to include a description of the proposed activity, including a characterization of existing baseline conditions. See, e.g., CEQA Guidelines § 15252(a).

RWQCB's TMDL proposal, and the short time frame provided by RWQCB for these comments, this reservation is of particular importance.

The Report contains an inadequate characterization of baseline conditions. The Report does not address to what extent the existence of PCBs in the Bay is causing environmental and/or human health impact, nor does it address the costs associated with any such impact. The Report mentions a 1994 fish advisory for the Bay issued by the Office of Environmental Health Hazard Assessment but does not disclose that the 1994 advisory was not based on a risk assessment or a determination that PCBs in fish above a certain level were unsafe. Is the fish advisory being maintained by postings or other methods? Has there been any decrease in fishing activity due to it? What are the costs of any such decrease? Are any persons consuming fish from the Bay at levels that would be unhealthy if sustained over many years? How should any such potential effects be adjusted to reflect naturally declining levels of PCBs in the Bay? What empirical evidence is there of current adverse impact to ecology? What are the costs associated with any such impacts?

The above questions are illustrative of issues that need to be addressed to characterize the baseline condition of the Bay. RWQCB cannot make a meaningful assessment of the potential consequences (i.e., any benefits and adverse impacts) of a PCB TMDL without first characterizing the existing condition, since any such benefit requires a comparison between the future condition after the TMDL is implemented, and the existing condition. The Report does not offer an adequate characterization of baseline conditions, and we urge RWQCB to provide an adequate characterization in order to meets its obligations under CEQA.

B. Alternatives Analysis

CEQA requires RWQCB to analyze alternatives to the proposed activity. See, e.g., CEQA Guidelines § 15252(a).

The Report contains no discussion of what alternatives RWQCB considered. Rather, it presents a single alternative containing certain kinds of targets, and load reductions for certain sources of PCBs. RWQCB needs to articulate and characterize a range of alternatives sufficient to satisfy CEQA. RWQCB should treat natural recovery as one such alternative, instead of treating it simply as a process to consider when developing other alternatives. Specific questions we request RWQCB to address include:

- Did RWQCB consider any alternatives wherein PCBs in fish were assumed to derive in significant measure from sources other than sediment? Where is the assessment to support the sediment-dependent scenario selected by RWQCB? Where is the empirical evidence that fish are getting a large percentage of their PCBs from Bay sediments, as apparently assumed by RWQCB?

- What alternatives to a sediment target did RWQCB consider? To the extent alternatives were considered, why were they rejected? Did RWQCB consider numeric values different from the selected value of 2.5 ug/kg? These questions are particularly important given that the 2.5 value is a screening level not meant for regulatory use, is about 4 to 10 times lower than reported background levels of PCBs in the Bay,

and is orders of magnitude below almost all acceptable, residual "leave-behind" PCB levels at sites throughout the country. In addition, a sediment target is not required or authorized by the Clean Water Act, and, as RWQCB knows from information in its own files, sediment targets are not used in the vast majority of PCB TMDLs.

- What alternatives to a fish tissue target did RWQCB consider? To the extent alternatives were considered, why were they rejected? Did RWQCB consider numeric values other than the selected value of 22 ng/g?

- Did RWQCB consider an alternative wherein wastewater discharges were assigned a load reduction? Did RWQCB conclude that PCBs in such wastewater were not bioavailable to fish in significant amounts? What is the basis for any such conclusion?

- Did RWQCB consider the alternative of monitored natural recovery with institutional controls? In this regard, RWQCB cannot make any meaningful decisions as to this alternative until it obtains and uses a model for natural recovery that is reasonably accurate. RWQCB's apparent rejection of this alternative at this stage is premature and unfounded, as the agency's current natural recovery model contains significant flaws.

C. Impacts Analysis

CEQA requires RWQCB to include a discussion of any significant or potentially significant adverse effects on the environment as well as mitigation measures proposed to avoid or reduce such effects. See, e.g., CEQA Guidelines § 15252(b). The regulations applicable to RWQCB's CEQA procedure require consideration of a lengthy list of potential environmental effects.[3]

The Report does not address any of the myriad potentially adverse environmental impacts that may result if the TMDL is implemented. What will be the impact on maintenance dredging, the ability to keep the region's ports open for business, and the costs of, and options for, disposal of dredged material? What will be the impact on projects to restore or reclaim habitat, or construct wetlands, given that such projects typically rely on the availability of sediment that can be used as a resource? What will be the impact on waterfront development and redevelopment, since such economic activity is likely to encounter sediment with levels greater than 2.5 ug/kg? How will PCB mass be removed from the sediment? If dredging is contemplated, what is the cancer risk from the likely exposure of area residents to diesel emissions from dredging equipment?

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[3] California Code of Regulations, Title 23, Division 3, Chapter 27, Article 6, § 3782 "Exempt Regulatory Programs," Appendix A.

Because the Report contains such scarce information and content on RWQCB's implementation plans, the agency has made it extremely difficult for the regulated community and the public to help the agency identify and anticipate the likely array of potentially adverse consequences. Identification and characterization of potentially adverse environmental impacts is the fundamental purpose of CEQA. Given the vagueness of RWQCB's implementation plan, at this stage it is possible to only scratch the surface as to potential adverse impacts.

D. Performance Standards

The State Water Board has stated, "TMDLs typically will include performance standards. TMDLs normally contain a quantifiable target that interprets the applicable water quality standard."[4] Under Section 21159 of the Public Resources Code, when RWQCB adopts a performance standard, it must prepare an analysis of the reasonably foreseeable environmental impacts arising from the reasonably foreseeable methods of compliance with the standard, as well as an analysis of economic and technical considerations arising from the reasonably foreseeable methods of compliance with the standard.[5] Does RWQCB consider the proposed sediment and fish targets to be performance standards subject to Section 21159? The Report and associated materials make no mention of Section 21159. State Board guidance makes clear that Section 21159 applies to TMDL targets. What steps does RWQCB intend to take to comply with Section 21159, including its requirement to consider both the environmental and economic impacts that may result from compliance with the Amendment?

III. Conclusions

The Report provides no indication that RWQCB is on a path that will enable it to satisfy its CEQA obligations. The Report does not adequately describe the project or baseline Bay conditions; it does not discuss alternatives to the proposed Amendment; it does not characterize the environmental impacts of the reasonably foreseeable methods of compliance with the Amendment; and it does not give any consideration to the direct or indirect economic impacts that could result from the Amendment. It is particularly troubling that RWQCB may have pre-selected a preferred alternative with an incorrect sediments bias without any indication that its discretion in reaching this apparent decision was informed by CEQA. Unless the environmental analysis required by CEQA is contained in other materials not yet submitted for public comment, it would appear that RWQCB needs to make fundamental changes to its approach if it hopes to meet its requirements under CEQA.

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4 State Water Resources Control Board Office of Chief Counsel Memorandum, "Economic Considerations in TMDL Development and Basin Planning."

5 We do not concede that the performance standards proposed by RWQCB would be valid if RWQCB met Section 21159. There are numerous other procedural and substantive requirements with which any such standards must comply.

We appreciate the opportunity to provide these comments and questions, and are available to discuss them at your convenience. We respectfully request RWQCB to add this letter to the administrative record for the subject TMDL and the Amendment.

Respectfully submitted,

Paul Singarella
of LATHAM & WATKINS LLP

cc: Fred Hetzel, RWQCB

Marin Audubon Society Box 599 Mill Valley, California 94942-0599

February 20, 2004

Tom Mumley
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street
Oakland, CA 94612

RE: COMMENTS ON TMDL FOR PCBs

Dear Mr. Mumley,

Marin Audubon Society supports implementation of quantifiable and controllable load reductions and other activities designed to reduce PCB bioavailabity in the Bay. We have long believed that Bay sediment quality has been neglected. We support use of the human health criterion to protect human health and wildlife. The Board should make every effort to reduce current loads of PCBs to the Bay.

However, waiting 100 years to attain the targeted reduction in fish tissue is unacceptable. This approach places the current and short-term future human and wildlife populations at risk. A more aggressive program to reduce PCB levels in at least in half that time should be developed and implemented. We find the implementation component to be particularly deficient.

We recommend that the implementation program be strengthened by requiring further reductions from all sources, in at least the following ways:

- Wastewater Treatment facilities -. Each treatment facility should have to reduce PCB loadings through programs that maximize conservation and reuse, or eliminate discharge altogether. All treatment plants should be required to have advanced treatment systems to ensure maximum performance

- Dredging - Because the active sediment layer is the largest mass of PCBs that is bioavailable, attention should focus on lowering disturbance of these sediments. The LTMS program does not go far enough to reduce dredging in the Bay. It focused on in-bay disposal and did little to reduce dredging. It is not even clear that dredging volumes would be reduced. Even if the disposal of dredge material is reduced in volume, PCB levels could be significant locally, and must be considered cumulatively.

The RWQCB should recommend, and advocate to LTMS agencies, a more aggressive program to reduce dredging in the Bay. And the RWQCB should establish its own strict dredging requirements. For example, dredging in areas of high silt deposition, such as exist in the North Bay, and/or high levels of PCB's, should be actively discouraged and/or prohibited to avoid continued resuspension and deposition of these sediments.

We continue to be concerned about disposal in so called "upland" disposal sites, which are often interpreted to be diked baylands. Use of diked historic baylands for disposal exposes wildlife to PCBs because most of these areas pond with water in winter and provide seasonal wetland habitat for shorebirds, waterfowl and other upland species. Use of diked baylands for upland disposal of sediments high in PCBs may also threaten the future use these properties for future restoration and enhancement as habitat.

• Central Valley discharges, although lower in PCB levels than in-bay generated sediments, are still higher than the sediment target and should be required to reduce PCBs loading. The SF Bay RWQCB should work with Central Valley Board to ensure that further reduction of PCB loading. If the current PCB levels from the Central Valley were reduced, the benefit to the Bay from burial would be even greater.

• Industrial - Industries should be required to further reduce PCB loading to the Bay. PCB concentrations in the North Bay, the location of most of the industries, may be low because tides carry sediments to lower area of Bay.

• Urban Runoff - Requirements for on-land reduction and source control should be developed and implemented.

• Hot Spot Remediation - The goal of remediating hot spots is laudable. However, it is not clear what the program would consist of. Is there a plan of action? Does the RWQCB plan to sue property owners? Is there funding available to remediate areas for which no responsible owner can be found?

In conclusion, we strongly recommend that the RWQCB increase and strengthen its implementation program, increase requirements that will reduce PCBs from all sources, and reduce the time line for the target reduction. To do otherwise is not in the interest of the public.

Sincerely,

Barbara Salzman
Conservation Committee

PACIFIC ECORISK ENVIRONMENTAL CONSULTING & TESTING

Fred Hetzel
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

February 19, 2004

Re: PCBs in San Francisco Bay – TMDL Project Report

Dear Mr. Hetzel,

Thank you for the opportunity to submit comments on the PCBs in San Francisco Bay, TMDL Project Report. We have been following your work on this TMDL effort for some time now, and would like to express our appreciation for all of the hard work that has gone into this report.

Many of the concerns that we had with earlier versions of the TMDL have been previously communicated to you through our participation in the Bay Planning Coalition. Some of these issues have been resolved in the current TMDL, while others have gone unaddressed; many of these latter concerns we are again responding to through our participation with the Bay Planning Coalition.

However, there were several very technical issues surrounding the derivation of the numerical target for sediments that we feel compelled to submit directly. Our comments on these issues, which we hope would be addressed in any finalization of this TMDL and/or subsequent Basin Plan amendment, are provided below.

Derivation of the numerical target for sediment PCB concentrations.

The establishment of "numerical targets" is one of the most important elements of any TMDL. In this TMDL, the Regional Board did not derive a sediment numerical target that is reflective of, or that is specific to, the conditions in San Francisco Bay. Instead, this TMDL simply adopts the screening value of 2.5 µg/kg total PCBs that had been previously established by the EPA in their National Sediment Quality Survey. Unfortunately, this raises several technical concerns:

a. *The EPA's derivation of the 2.5 µg/kg sediment screening value is not consistent with the Regional Board's fish tissue numerical target of 22 ng/g.*

The basic approach used by the EPA (and through their adoption, by the Regional Board) was to use the Theoretical Bioaccumulation Potential (TBP) model to calculate ***from*** their target fish tissue concentration ***to*** the target sediment concentration as follows:

$$(C_{ft}/f_l) = BSAF\ (C_s/f_{oc})$$

where: C_{ft} = target fish tissue concentration,
f_l = fish tissue lipid content, as a decimal fraction (e.g., 3% = 0.03)

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C_s = target sediment concentration,
f_{oc} = sediment organic carbon content, as a decimal fraction (e.g., 1% = 0.01)
BSAF = Biota Sediment Accumulation Factor (EPA used value of 1.85).

However, the EPA's derivation of a sediment screening value did not use the San Francisco Bay fish tissue screening value! To determine what the sediment numerical target *should be* for San Francisco Bay, we can plug the Regional Board's fish tissue numerical target concentration (22 ng/g [=22 µg/kg]) into this equation:

$$(22\ \mu g/kg)/0.03 = 1.85(C_s/0.01)$$

and then solve for C_s:

$$C_s = (0.01/1.85)(22\ \mu g/kg)/0.03 = 4.0\ \mu g/kg\ (\textbf{\textit{not 2.5 µg/kg!}})$$

This correction of the sediment numerical target to reflect the Regional Board's fish tissue numerical target has profound consequences upon all subsequent mass-balance modeling efforts, not to mention the TMDL Implementation.

b. *The adoption of a sediment target based upon the EPA's risk factor is overly conservative.*

In deriving their sediment screening concentration, the "EPA applied the cancer slope factor for aroclor 1260, the most potent commercial mixture, to all measures" of PCBs (i.e., the cancer risk estimation was based upon the assumption that the toxicity of all PCBs are equivalent to the toxicity of the worst PCB). However, the actual risk associated with other aroclors can be an order of magnitude or more less toxic! Comparisons of the actual risks of different congeners (using the TEF approach) reveals that there can be differences in toxicity as great as 4 orders of magnitude! As a result, the Regional Board's adoption of the EPA screening value is clearly over-conservative in estimating the actual human health risk posed by the PCBs in San Francisco Bay. We recognize that the current limited data set of PCB analyses of Bay sediments and fish tissues constrains the Regional Board's ability to generate technically accurate evaluations of risk, but believe that this issue should be acknowledged in the TMDL report, and that formal mechanisms need to be in place to allow for modification of the numerical target as better data become available, and/or to allow regulators to incorporate new information into future decisions regarding "compliance" with the TMDL implementation.

c. *The adoption of the EPA's use of other default modeling parameters precludes the numerical target from reflecting site-specific conditions in San Francisco Bay.*

In their use of the TBP model, the EPA used default values of 3% lipids in fish tissues, 1% organic carbon in sediments, and a BSAF of 1.85. While arguably appropriate as "generic" values, these values may not represent actual conditions in San Francisco Bay. In fact, the Regional Board acknowledges that, except for the white croaker, fish tissue

lipids in San Francisco Bay are typically <3%, resulting in a numerical target that is overly-protective, given actual Bay conditions.

The Regional Board states that organic carbon concentrations in the Bay "are generally around 1%"; the basis for this assertion is not stated. Presumably, this is based upon the RMP data set for sediment analyses performed during 1993-2001. However, it is important to note that the RMP stations during that period were located primarily along the spine of the bay where the relatively higher-energy environment can be expected to favor coarser sediment particles and lesser organic carbon, and that the sediment organic carbon can be expected to increase as one moves towards the margins of the Bay. The Bay Protection and Toxic Cleanup Program reported a mean sediment TOC concentration of 1.43% for the San Francisco Bay reference sites (Hunt et al. 1998), which would result in a significant increase in the sediment PCB concentration numerical target for San Francisco Bay.

Table 1. SF Bay BPTCP Reference Site sediment TOC characteristics.

mean	s.d.	range	n
1.43%	0.65	0.74-4.32	43

Furthermore, sediment PCB concentrations will co-vary positively with sediment organic carbon. As a result, it seems likely that the actual average sediment organic carbon concentrations in San Francisco Bay are >1% (particularly in those areas at which there are elevated PCB concentrations), and that as a result, there will be reduced bioavailability and concomitant reduced bioaccumulation of PCBs in San Francisco Bay than is predicted by the EPA TBP modeling.

Similarly, the use of a BSAF value of 1.85 may not reflect actual San Francisco Bay sediment bioaccumulation characteristics. Recent studies have indicated that the bioaccumulation of PCBs by benthic organisms can vary significantly between sites due to the different bioavailabilities exhibited by different types of sediment organic carbon (Pickard et al. 2001). The descriptive statistics for PCB BSAFs from the US Army Corps of Engineers Engineering Research and Development Center Waterways Experimental Station (ERDC WES) BSAF database are summarized in Table 2, and similarly indicate a high degree in variability of BSAFs between sites.

Table 2. Summary of characteristics of PCB BSAFs from the US ACOE ERD WES BSAF database.

Source	Mean	SD	n	Range	Median
Field	1.70	2.10	293	0.01-11.0	0.79
Lab	1.18	0.97	206	0.04-4.74	0.80

This is of significant concern as the actual site-specific bioaccumulation of PCBs may be markedly less than the "predicted" bioaccumulation (Pickard et al. 2001). This concern is evidenced here in San Francisco Bay by recent efforts to model PCB bioaccumulation from sediments based upon "traditional" equilibrium partitioning approaches. In the

Gobas Food Web model (referenced in Section 7.2 of the TMDL report), the actual bioaccumulation of PCBs in benthic invertebrates was markedly less than each of the predicted PCB congener concentrations, and 44% of the PCB congeners that were predicted to be elevated in the tissues could not even be detected! This empirical data suggests that the site-specific conditions in San Francisco Bay do, in fact, result in less bioaccumulation than is predicted using the traditional modeling approaches, and that the predicted sediment numerical target of 2.5 µg/kg is overly-protective.

d. *The long-term planning and implementation that is required for PCBs in San Francisco Bay does not incorporate expected changes in the toxicity of the PCBs.*

It is recognized that the attainment of water quality objectives (including beneficial uses) for PCBs will take many years to achieve. However, the changes in the toxicity of the PCBs in San Francisco Bay that can be expected over this extended time-frame is not acknowledged nor incorporated into the TMDL.

Congener-specific weathering (e.g., volatilization, metabolism, and dechlorination) of PCBs can result in significant changes in total PCB concentrations and in the overall PCB composition over time. The less chlorinated PCBs are typically lost relatively rapidly due to volatilization and metabolism. As the degree of chlorination increases, the PCB becomes more resistant to volatilization and metabolism, and also more hydrophobic (i.e., more likely to sorb to particulates) and more lipophilic (i.e., more likely to bioaccumulate in tissues), and to a certain extent, more toxic.

This means that as a result of weathering, the PCB composition will 'shift" towards forms that tend to move into sediments and into tissues relatively quickly. Given that the majority of the PCBs in San Francisco Bay have likely been in the environment for many, many years (PCBs have not been manufactured in the US since 1977), it seems similarly likely that much, if not most, of the volatilization and metabolism that would readily occur has already done so during the intervening 25+ years.

However, there is another process, reductive dechlorination, that takes place in anaerobic sediments, that can result in significant reductions in the toxicity of PCBs. Reductive chlorination does not remove all of the chlorines nor does it affect the basic biphenyl structure of the PCB molecule; however, reductive dechlorination *does* preferentially remove chlorines from the meta- and para- positions on the PCB, which greatly reduces the carcinogenicity of the PCB. As a result, there is no significant change in the total PCB concentration, but the change in constituent congeners results in a significant change in toxicity. Studies have indicated that this process can reduce the overall toxicity of the total PCB mixture by several orders of magnitude (Quenson et al. 1998). Without acknowledgement and consideration of this process, significant effort and resources could be mis-spent in future years trying to reduce the concentration of the PCBs, when in fact, the PCB toxicity itself has been reduced to non-problematic levels!

We hope that these comments will prove helpful in the development of a TMDL that more effectively addresses the potential water quality impairment caused by PCBs in San Francisco Bay. If you have any questions or would like to discuss these issues in greater detail, please give me a call.

Respectfully,

R. Scott Ogle, Ph.D.

Citations:

Gobas F, Wilcockson J (2003) San Francisco Bay Food Web Model. RMP Report, SFEI Contribution 90, San Francisco Estuary Institute, Oakland, CA.

Hunt JW, Anderson BS, Phillips BM, Newman J, Tjeerdema R, Stephenson M, Puckett M, Fairey R, Smith RW, Taberski K (1998) Evaluation and Use of Sediment reference Sites and Toxicity Tests in San Francisco Bay. CA State Water Resources Control Board, Sacramento, CA.

Pickard SW, Yaksich SM, Irvine KN, McFarland VA (2001) Bioaccumulation potential of sediment-associated polychlorinated biphenyls (PCBs) is Ashtabula Harbor, Ohio. J Great Lakes Res 27(1):44-59.

Quenson JF, Mousa MA, Boyd SA, Sanderson JT, Froese KL, Giesy JP (1998) Reduction of aryl hydrocarbon receptor-mediated activity of polychlorinated biphenyl mixtures due to anaerobic microbial dechlorination. Environ Toxicol Chem 17(5):806-813.

US EPA (1997) The incidence and severity of sediment contamination in surface waters of the United States. Volume 1: National Sediment Quality Survey. EPA 823-R-97-006. United States Environmental Protection Agency, Washington, D.C.

PSSEP
Partnership for Sound Science in Environmental Policy

Bay Area Clean Water Agencies

Bay Planning Coalition

California Association of Sanitation Agencies

California Council for Environmental & Economic Balance

California Manufacturers & Technology Association

Chemical Industry Council

Contra Costa Council

Oakland Metropolitan Chamber of Commerce

Pacific Merchant Shipping Association

San Leandro Chamber of Commerce

Tri-TAC
Sponsored by:
League of California Cities
California Association of Sanitation Agencies
California Water Environment Association

Western States Petroleum Association

Craig S.J. Johns
Executive Director

February 24, 2004

Mr. Fred Hetzel
San Francisco Bay Regional
Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612

Re: Comments on the PCBs in San Francisco Bay Total Maximum Daily Load (TMDL) Project Report

Dear Mr. Hetzel,

The Partnership for Sound Science in Environmental Policy (PSSEP) appreciates the opportunity to comment on the San Francisco Bay Regional Water Quality Control Board's (Regional Board) *January 8, 2004, PCBs in the San Francisco Bay: Total Maximum Daily Load (TMDL) Project Report* (Project Report). PSSEP is an association of San Francisco area and statewide public and private entities – businesses, municipal wastewater treatment agencies, trade agencies and community organizations. PSSEP was founded on the overriding principle that federal, state and local environmental policy decisions should be predicated on sound, objective science. PSSEP's comments on the Project Report are as follows:

Required Studies and Monitoring

The Staff Report requires municipal and industrial discharger to not only evaluate the localized bioavailability of their discharges but also to develop and implement source control programs to minimize PCB intakes, and undertake studies to evaluate the bioavailability of PCBs from different sources and the long term fate of PCBs in the Bay (pgs. 59-60). Municipal and Industrial Wastewater will also be required to monitor, track and quantify discharges (p. 62). The Project Report should provide the nexus between these required studies, the need for these studies and the party responsible for the study. The requirements should be consistent with Water Code Section 13267 in which states: "The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring *that* person to provide the reports (emphasis added)."

Mass Offset Program

The Project Report requires Municipal and Industrial Wastewater Dischargers to evaluate the potential for developing a mass offset program for PCBs in the Bay Area (p. 60). Although PSSEP supports the notion of mass offsets, we believe that any program developed should be voluntary and only one of a number of tools that can be used to reduce PCBs concentrations in the San Francisco Bay.

Rationale for Load and Waste Load Allocations

The Project Report calculates the waste load allocations (WLAs) for Wastewater Dischargers based on current performance, and calculates the WLA for Urban Runoff based on sediment target for Urban Runoff. Load allocations (LA) for Central Valley and In-Bay Dredged Material Disposal are based on the sediment target.

PSSEP supports that the Project Report recognizes that Municipal and Industrial National Pollutant Discharge Elimination System (NPDES) permitted facilities discharge only a small fraction of the total PCBs to the Bay and that wastewater dischargers operate at a high level of performance (p. 55).

PSSEP believes WLA and LA should be feasibly implemented and achieved, economically viable and can ultimately meet the environmental goals of the TMDL. We agree that an adaptive implementation plan is necessary. However, we are concerned that the Project Report has not evaluated either the feasibility or economic consequences of the WLAs and LAs. For example, the Project Report assumes that urban runoff can meet its WLA by addressing hot spots, potentially treating highly contaminated water, and implementing BMPs. Wastewater Dischargers are expected it implement effective PCB source control programs. However, because the Project Report does not identify major sources of PCBs that can be controlled, these point sources may not be able to meet their WLAs.

The rationale for choosing the WLAs and LAs, the options considered, and the feasibility of the implementation plans to meet these allocations should be reflected in the Project Report and through the California Environmental Quality Act (CEQA) review required for the Basin Plan amendment. In addition, PSSEP believes the consideration of all provisions stated in Water Code Section 13241 should be evaluated in determining numeric targets, WLA and LAs, and the Implementation Plan. This evaluation should be described in both the CEQA document and the Project Report.

TMDL Numeric Targets

The Project Report proposes a sediment target of 2.5 µg/kg and a fish tissue target of 22 ng/g. PSSEP supports the position contained in the Project Report that the TMDL target should not be based on California Toxics Rule (CTR) water quality objective (WQO).

PSSEP endorses the commitment on page 58 to continue monitoring of the TMDL target and to reevaluate the appropriateness of the currently proposed fish tissue target and sediment target. We believe an adaptive approach to numeric targets contained in the Project Report is needed given the need to better understand the relationship between PCB and the beneficial uses, the uncertainty surrounding sediment quality objectives, the fact that sediment background concentrations are higher than the sediment target and the uncertainties surrounding the transport of PCB-laden sediments in the San Francisco Bay. PSSEP would like to see more information in the implementation plan regarding how the adaptive approach will be used to modify numeric targets if appropriate.

Although PSSEP recognizes that background concentrations vary, we are unclear as to what concentration or range of concentrations will be considered background. Page 47 of the Project Report states: "We are only proposing to apply this target to bedded sediments. …The need to reduce ambient sediment PCBs concentrations by an order of magnitude to attain the 2.5 µg/kg goal is not unexpected." Page 28 states: "Sediments considered ambient are from locations distant from known sources of contamination and have PCBs concentrations that cannot be statistically differentiated from other sediments collected in similar environments." On page 16, the Project Report states that ambient background concentrations of PCBs are around 10 µg/kg, however on pages 29, 35 and 61 of the Project Report, the ambient background concentrations of PCBs are stated to range from 20 to 35 µg/kg.

Individual Waste Load Allocations in the Basin Plan

Page 36 of the Project Report states: "Individual waste load allocations will be specified for each municipal and industrial wastewater dischargers as we incorporate the PCBs TMDL into the Basin Plan. Individual load allocations will be based on each facility's fraction of the total yearly wastewater discharged from this source category." The Implementation Plan assumes that wastewater dischargers will be required to maintain their current loadings at the current level of performance. Unfortunately, the Project Report lacks specific detail on how individual WLA will be applied both in the Basin Plan and in NPDES permits. The Regional Board's Mercury TMDL Project Report[1] also contemplates measuring Wastewater

[1] San Francisco Bay Regional Water Quality Control Board: "Mercury in San Francisco Bay: Total Maximum Daily Load (TMDL) Project Report" June 6, 2003 p. 61.

Discharger's mercury WLA compliance as a group, but contains additional information on how compliance will be measured and how individual WLA will be utilized. In the Mercury TMDL Project Report, the Regional Board has proposed evaluating compliance with the municipal and industrial wastewater mercury TMDL over a five year period, which allows for seasonal variations. PSSEP recommends the Regional Board add a similar level of detail to the PCB Project Report.

PSSEP is also concerned that as proposed, the WLAs for municipal and industrial wastewater will be derived from a minimum amount of samples from nine publicly owned treatment works (POTWs) and five refineries. The samples were taken from few sampling events during, in most cases, one discharge season. We believe that these data may not adequately reflect current plant performance, further underscoring the need for the PCBs TMDL to be flexible and adaptive as more current and robust information is generated.

Other Information

PSSEP requests that the following statements contain a reference notation in the Project Report:

- "Follow-up studies in 1997 and 2000 confirmed the presence of PCBs in Bay fish tissue at concentrations that may be harmful to fish consumers" (p. 18).
- "However, individual PCB congeners have widely varying potencies for producing a variety of adverse biological effects, including hepatotoxity, developmental toxicity, immunotoxity, neurotoxicity, and carcinogenicity" (p. 19).

Thank you for the opportunity to provide these comments on the PCBs TMDL Report. We look forward to working with staff in finalizing the Report before consideration by the Regional Board.

Sincerely yours,

Craig S.J. Johns
Executive Director

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PORT OF OAKLAND

February 17, 2004

Dr. Bruce Wolfe
Executive Officer
California Regional Water Quality Control Board
~~2101 Webster Street~~ 1515 Clay St., Suite 1400
Oakland, CA 94612

Subject: PCBs in San Francisco Bay Total Maximum Daily Loads Project Report, December 2003

Dear Dr. Wolfe:

This letter constitutes the Port of Oakland's preliminary comments on the PCB TMDL report, as well as scoping comments for the Regional Board's discharge of their CEQA responsibilities. We believe that the problems with this draft are so substantial that you cannot rely on the document without further public review, and recommend that such review be combined with the peer review process to ensure that the technical concerns raised by the document can be resolved.

The dredging community has serious policy and technical concerns with the current draft of the TMDL recommendation, which can be divided into four areas. First, the proposal fails completely to comport with the limitation of **any** regulatory program in that the proposals to make removal of PCB's from the Bay mandatory have no nexus with the role of dredgers in creating such wastes. Unless the program establishes a clear nexus between the control measures and the affected dischargers, it could be invalidated as exceeding the Board's authority. Second, the proposal to mandate removal of dredged material from the Bay will have significant impacts on air quality, and may also have significant impacts in exacerbating the sediment shortage within the Bay. As such, this proposal may actually increase levels of PCB's in water and bay organisms, and be counterproductive to the stated goal. These impacts need detailed analysis in your CEQA work, and the cursory analysis given these subjects in the LTMS final EIR cannot be relied on for this purpose. Third, the proposal in the TMDL report takes the voluntary program that came out of the LTMS effort and uses it, with a number of very simplistic assumptions, to create an "allocation" for dredging. This threatens to reopen a number of policy issues that were deferred during development of the LTMS. Finally, we believe that the program set forward is seriously flawed technically, and fails to set out realistic or even possible measures that will address the serious PCB problems of San Francisco Bay. In lay terms, the idea that we are somehow going to clean up San Francisco Bay and solve our TMDL problems by taking maintenance dredging material to the ocean -- or upland -- is akin to trying to solve the problems in a flooded kitchen by bailing it out with a teaspoon while the taps are still running. This letter will elaborate on some of these concerns.

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NEXUS

The TMDL document does not establish any nexus between the contaminants contained within dredged material and the activities of the dredgers that are sufficient to mandate a regulatory program of the nature proposed. The logic of considering dredged material as a load to the bay was set forth by Gunther et al.(1990) as follows (These authors did not appear to distinguish between maintenance dredging and new work, but only maintenance dredging is appropriate to the present discussion.):

> ...contaminated dredged material may serve as a source of contaminants that had previously been sequestered in sedimentary deposits. Potentially harmful materials that had been taken "out of circulation" by natural processes may, once again, become distributed among benthic and pelagic communities...

It is as though a vital part of society's infrastructure - dredged and maintained channels and other vessel facilities – existed for no other purpose than to sequester contaminants, or else they missed the point that if the channels did not exist, the same particle-associated contaminants would still be available to biota as part of the active sediment layer. It is one thing for a regulator to regulate the disposal of contaminated mud. The law is clear on that. But it seems quite another thing, in the fabric of a supposedly technical discussion, to pretend that dredgers effectively create contaminants, or that impairment of the bay would be substantially relieved if all dredging were suddenly to stop. In fact, unless maintenance dredging is deferred for a number of years, the contaminants that may be contained in maintenance dredging material are constantly disturbed and therefore biologically available. Since tests show contaminant levels in maintenance material and in recently deposited mudflats off Berkeley and Richmond to be essentially the same, the deposited materials are characteristic of the material floating in the Bay, not of contaminants added within the Port area.

While the simple box model developed by Jay Davis at SFEI is a useful addition to the analytical framework that we need to develop TMDL's, it does not fulfill the requirement to establish a nexus between the nature of regulation and the State interest that must be protected. In the case of the PCB box model, the assumption made about the active layer drives the results of the model. Given the great mass of PCB's contained within the Bay, and the different energy environments within the Bay, the assumption of a uniform depth of mixing is too gross a simplification of physical processes to represent a basis for nexus. Fifteen centimeters is assumed in the model, and used without reflection in the TMDL report. Three different things affect the actual mixing layer in a significant way: wave energy, current velocity, and biological communities. (Other factors, especially the density of the benthic sediments also affect mixing. But since the nature of bottom sediments is determined in substantial part by the sheer stress at the bottom, effectively capturing the different sheer stress from wave energy and current velocity captures this variable as well.) The first two factors affect mixing directly, as these phenomena operate as sheer stresses on the bottom, mixing the sediment whenever critical sheer stress levels are reached. Biological communities mix sediment directly, through

bioturbation whereby benthic organisms mine the sediment and mix the sediment through ingestion and excretion. Conversely, certain communities, particularly dense communities of the Amur River clam *Potamacorbula*, can actually armor the bottom and limit mixing. The simple box model does not capture the physics or biophysics of the mixing process directly, or indirectly. The latter could readily be accomplished by measuring sheer stress directly, or by estimating sheer stress by hind casting wave energy. Ample wind records are available to perform such hind casting with substantial accuracy.

I would posit based on my observations of daily wind patterns during spring and summer days, that the sediments in San Pablo Bay are exposed to a dramatically greater level of bottom sheer stress than the near shore sediments in Richardson Bay, where fetch is minimal. I would also posit that the near shore environment of the East Bay between the Bay Bridge Terminal and Point Richmond are strongly depositional. In those areas, the issue of the active layer is less important because the in-situ sediments are being diluted or covered with more recent and somewhat cleaner sediments—and we can expect that trend to continue.

We have argued previously - successfully, it seemed at the time – that, from a mass-balance perspective, maintenance dredging is logically no more than a small part of the natural cycle of deposition and re-suspension of sediment within the bay. In the terms of the SFEI mass-balance model reproduced in the TMDL Report as Figure 19, maintenance material should never be thought of as having left the active layer. If anything, disposal at SF11 should be considered as effective relocation of contaminants already in the Bay. Disposal at the dispersive Alcatraz site will increase the fraction of the material exiting the Golden Gate through ebb currents, as implied in Figure 6 of Krone (1979). If the PCB concentration in some maintenance material is somewhat above ambient, that is because maintained facilities tend to be closer to shore, and thus to sources of contaminants.

Staff comments at the scoping meeting attempted to clarify the Regional Board's view that the TMDL strategy proposes to rely on the existing LTMS approach as "reasonably reliable" under CEQA, rather than add a layer of new regulatory requirements that mandate such an approach. While that assurance is somewhat comforting, we have difficulty in rationalizing the term "allocation" with a non-regulatory approach, and would like a clear explanation of your approach on the record.

It is only somewhat easier to posit a nexus in the case of owners of storm drainage facilities, such as the Port of Oakland. Case law in upland contamination generally holds landowners responsible for contaminants left on their property by tenants, or by illegal dumping on unsecured lands. However, making this case for storm drains at the lower end of watersheds, where the storm drains transit substantial distances, and contributions are generated by the entire watershed, may be difficult. It may well be that accumulation and removal of contaminated sediments from the lower portion of watersheds makes sense, and represents a cost-effective approach to removal of PCB loads. (Sediments will always settle preferentially in the lower portion of watersheds because that is where the

stream slope is the most gentle and sedimentation can occur.) In that case, the Regional Board may need to establish mechanisms to spread the cost of such management over the entire watershed that generates the material in question.

SIGNIFICANT IMPACTS

In various comment letters that we have sent to your agency as part of the development of the LTMS, the Port of Oakland has pointed out significant impacts that could occur if dredged material is removed from the Bay without consideration of the associated environmental impacts of such construction projects. Substantial detail on the nature of these impacts was presented to you by the individual dredgers at the LTMS management meeting on January 30, 2004, and included increased air emissions, and increased risk of spills. Other impacts are identified in earlier letters including the potential impact on sediment balance in the Bay (see for example USGS Open-File Report 98-759, "Sedimentation and bathymetric change in San Pablo Bay, 1856-1983" by Jaffe, B. E., Smith, R. E., and Torresan, L. Z.) Ironically, removal of dredged material from the Bay, and policies prohibiting consideration of in-Bay beneficial uses such as armoring of erodible deposits, have the potential to increase, rather than decrease, the rate at which PCB's and mercury are eroded from bedded sediments in San Pablo Bay and made more available to biological systems. We do not believe that the Regional Board can rely on the EIR prepared for the LTMS because it simply did not analyze these impacts, and deferred analysis for later regulatory efforts such as this.

THE TMDL WILL NOT ACHIEVE THE STATED GOALS

We believe that there are serious issues with the selection of 2.5 ppb as a sediment level that will resolve the impairment issues PCB poses to San Francisco Bay. We understand that others, organized by the Bay Planning Coalition, will address these issues in some detail. In summary, there are substantial differences in the toxicity of the various PCB congeners, differences in the degree to which such congeners can be sequestered in the sediment such that their bioavailability is reduced, and substantial differences in the process of breakdown of these congeners. None of these are reflected in the document's reliance on **total** PCB levels. A better understanding of these factors would provide both for a more effective control strategy, and a better understanding of the fate and transport of PCB's in the Bay. We strongly recommend that the Regional Board convene a technical workshop and include other parties now developing technical comments. We also recommend that you designate your peer review panel and invite their attendance at that workshop. We think the current document needs such peer review before you can rely on it to develop a recommendation for a Basin Plan amendment.

We take no issue with removal of elevated hot spots of PCB's; this should clearly be done. But two questions must be answered: what concentrations constitute "elevated hot spots", and will this measure remove a substantial mass of PCB's compared to the ongoing inputs and erosion of legacy deposits? Load reductions through removal of hot spots and export of maintenance dredging material are not sustainable. The sources of the PCBs associated with dredged material are ultimately in the watersheds. As those

sources are discovered and cleaned up, bay sediments will gradually become cleaner, and the quality of maintenance-dredged material will improve accordingly. This scenario points out a flaw in the loads reduction plan of this TMDL. That is, as watershed sources are progressively cut off and ambient sediment concentrations respond, the PCB load assigned to dredgers will no longer exist. For example, when ambient concentrations become half of what they are today, the logic of section 5.3 gives an estimated PCB "load" due to in-bay disposal of only 6 kg (cf Table 25). The 11-kg per-year load reduction attributed to dredgers would then be impossible to achieve through upland disposal of maintenance material. This would become apparent if the SFEI model were actually modified to include maintenance material and then run. We strongly recommend that the report be modified, and consistently utilize a mass reduction framework to evaluate and rank different control strategies.

The difficulties of the proposed load reduction model do not end with maintenance-dredged material. It is not clear what sorts of load-reduction programs are envisioned, but it is difficult to imagine how the PCBs from the watersheds will be removed from bay tributaries without also removing the sediments. However that may be done, we must then ask, "where will all the clean sediment come from, to dilute and/or bury the presently contaminated sediment?" Without clean sediment entering the bay, the only processes that can improve sediment quality are those that destroy or remove PCBs directly. At present, the only human activity that does this is dredging, which, as argued above, will give diminishing returns as the bay gets cleaner. The other reduction processes are degradation and volatilization, which are slow. Furthermore, if sediment supply is insufficient to balance erosion of the bay bottom, then historical deposits of even more-contaminated sediments will enter the active layer. During the scoping meeting, your staff used the analogy that cleaner sediment coming from watershed sources will eventually dilute the "sand in the sandbox", allowing us to clean up the sand. Although this is a useful analogy, we're not sure that it applies, particularly given the stated goal of 2.5 parts per billion as an eventual target.

The draft TMDL report does not consistently use data that would allow this analogy to be examined; indeed, it appears that such data is not available, notwithstanding over ten years of monitoring through the RMP. It appears, examining Figure 8 and the reference on page 34 of the report, that ambient levels in the central Bay may lie somewhere between 12 and 35 parts per billion. If the Bay were otherwise static, inflows of somewhat less than 2.5 ppb for a substantial period of time would be required to dilute the "sand" in the sandbox.

The largest load posited in the report comes from the delta (page 50). Rigorous application of the cleaner sand in the sand box analogy seems to fall apart here. The load from the delta is considered to be about half of the total load at present and, under the load reduction plan, will only be cut by 25% (Table 27). The 42-kg PCB load from the delta is principally water-born (Table 17), but sediment-associated. From Table 2, we have an estimate of the sediment load from the Central Valley of 8 million cubic yards, or (from equation 2 and conversion of units) about 4.4 billion kg of sediment. Dividing the delta PCB load by the sediment load, we obtain a mean sediment concentration from the

Central Valley of roughly 10 ppb, indistinguishable from the "mean" concentration used in the TMDL Report (Table 24). Unless sediment dynamics in the bay are very different from those in the SFEI model (they probably are), it does not seem possible to achieve the target of 2.5 ppb PCBs when the bay's major sediment source, after the hoped-for 25% load reductions, is projected to remain at three times this concentration. Therefore, at a minimum, a new model must be constructed, in which a more detailed understanding of sediment dynamics is incorporated. We suggest that even the present model, if modified to have a realistic picture of sources and sinks, will show that cleaning up the bay a dredge bucket at a time will be a centuries-long process.

Perhaps the most significant shortcoming in the report is the lack of attention to the reservoir of PCB's that are currently in the Bay. Although it may be impossible to estimate the load (or more precisely, flux) from this material accurately, it is not even possible to determine the underlying assumptions in the TMDL report. Using the information on page 34, a mass of at least 70,000 kg of PCB's is deposited in the Bay, at concentrations of 30 ppb or more. The best work by the USGS (Jaffe et al.) suggests that these deposits in San Pablo Bay are erosional. Any understanding of sediment dynamics in the Bay and management of the PCB load must consider these materials. If we assume only a small flux of 0.1%, then 70 kg/year are eroded, and it will take 1000 years for these deposits to dissipate. If we take a more realistic rate of 1%, and erosion will take 100 years, then flux accounts for 700 kg year, completely dominating the PCB budget. No placeholder has been established in the TMDL report for this process that would allow the adaptive management part of the program to either identify appropriate research, or search for management solutions for the flux. Since the bay is enriched at 4 to 5 times the target level, the flux from sediment erosion throughout the bay is undoubtedly substantially greater than has been laid out here. At a minimum, the TMDL report needs to establish a conceptual model for the cycling of current in-Bay PCB sources, and link that conceptual model to the adaptive management approach to show that the program will be dynamic and address the fundamental data gaps that must be closed to understand the problem and effectively manage it.

Finally, while we appreciate the assurances made in the 10 February scoping meeting that implementation of LTMS disposal volumes will be voluntary; we are puzzled by the load allocation of 1.4 kg PCBs in Table 27 of the TMDL. Even at 10 ppb, this amount would be contained in only 250,000 cubic yards of sediment, using Equation 2 and 50% solids. For such a restriction to become voluntary, dredgers would need to be convinced that those responsible for real loads to the bay were doing everything within their power to eliminate these problematic chemicals from their discharges.

ALTERNATIVES

It seems to us that the Regional Board needs to be more creative about potential alternatives for managing the PCB problems in the Bay. It also seems that the Board needs to consider the cost-effectiveness of different approaches. Control of PCB's will be difficult and expensive, and it makes sense to devote limited resources to those measures that will bring about the greatest reduction in PCB's. This approach is well

established in the air quality programs of the Bay Area Air Quality Management District, where those control strategies that bring about reduction of emissions at the lowest cost per ton are those pursued. Finally, the concept of adaptive management needs to be related more specifically to the cost-effectiveness of different measures.

Let me illustrate this with an example. Certainly there are storm drains with elevated levels of PCB's in the sediment. The cost of removal, and the volume of material can be estimated, and would result in a projected cost per kilogram of control. It may well be that ongoing removal of sediments from storm drains is cost effective compared to other approaches, and if so, should be continued. It may also be that sediments in storm drains have collected during a period when more PCB's were leaving the watersheds, and thus those levels will not be seen again. In any event, the strategy needs to include measurement of the removals and costs. If only a minor mass of PCB's can be removed in this way compared to inputs, then it may be wise to pursue other options that result in greater reduction of mass inputs.

I urge the Regional Board to be bolder in consideration of the volume of material in San Pablo Bay. It is possible that this material could be used as base fill for the eventual restoration of Skaggs Island, or the Bel Marin Keys area, where the material could be removed from the Bay and subsequently covered with cleaner material in a restored marsh. This approach has the potential to reduce the cost of marsh restoration and reduce the ongoing flux of sediment out of the bedded deposits. Alternative approaches to managing dredged material, such as using sandy material from maintenance dredging in the Carquinez Strait, could slow the rate of erosion and reduce the flux from this bedded material.

ADAPTIVE MANAGEMENT

As noted above, there are a number of fundamental data gaps that prevent accurate assessment of the current dynamics of sediment erosion as perhaps the only significant load to ongoing inputs of PCB's. Among those data gaps are:

- Effective understanding of the differences between PCB concentrations in sediment as they may vary throughout the Bay;
- Understanding of the actual, not assumed, depth of the active sediment layer, and how it varies in the different energy and benthic environments of the Bay.
- Understanding of the dynamics of sedimentation; (areas subject to ongoing sedimentation will gradually see lower sediment concentrations of PCB's as more recent and cleaner sediments are deposited.)
- Measurement of the mass removal from control strategies such as cleaning storm drain systems, and how that removal may change over time as watersheds generate a lower mass of PCB's.
- Quantitative information on the bioavailability of contaminants in a maintained navigational channel.
- Better estimates of losses of PCB's from the system through flux through the Golden Gate.

- More precise treatment of PCB chemistry, toxicity, and food chain dynamics.

To be effective and credible with the affected community of dischargers, the TMDL report needs to make clear the underlying conceptual models of PCB cycling, and how the adaptive management program will test the underlying conceptual model and adjust the resulting control strategy so that it is both effective and meets the nexus requirements.

Very truly yours,

Jim McGrath
Environmental Manager

Cc: Bay Planning Coalition, EPA Region IX, Jay Davis

February 20, 2004

Dr. Fred Hetzel
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Comments on PCB TMDL Report

Dear Dr. Hetzel;

The Port of San Francisco has reviewed the report *"PCBs in San Francisco Bay - Total Maximum Daily Load Project Report,"* dated January 8, 2004 (the report). While it is obvious that a significant level of effort went into producing the report, it suffers from serious deficiencies that we believe could be corrected through additional peer review and continued discussion with the regulated community.

The Port has reviewed draft versions of comment letters that will be submitted to the Regional Board by the San Francisco Public Utilities Commission (SF PUC), the Port of Oakland, and the Bay Planning Coalition (BPC). We concur with their findings, which provide evidence of serious technical and policy deficiencies. The Port urges the Regional Board to devote the effort necessary to adequately address each of the issues raised by these other organizations, in order to develop a sound, defensible policy. The Port does wish to emphasize and expand on four points:

1) The conceptual model used in the report, while not clearly or explicitly presented, seems to be a gross simplification of the complex hydrodynamics of San Francisco Bay. The model seemingly assumes uniform physical conditions throughout the Bay. These conditions apparently include a uniformly depositional environment, a uniform "active layer" of sediment 15 cm in thickness, and presumably the steady state wind, water flow, and tidal states required to produce uniform conditions. While assuming these conditions may have made the development of a model easier, the goal of the TMDL process is not to produce a simple model, but to produce a regulatory framework that provides measurable benefit to the environment. The Port does not believe that the use of such a simplified model as the basis of a regulatory program will result in the desired environmental benefit.

2) The idea that regular maintenance dredging and disposal of material at Alcatraz should be counted as a "source" of PCB loading to the Bay does not hold water. At all Bay ports, maintenance dredging is done to remove sediment that has recently migrated into a berth or channel from elsewhere. By definition, this is active sediment. Moving this active sediment from a berth or channel to a location where it is more likely to be flushed out of the Bay entirely would seem at worst to have no net effect on PCBs in the Bay. It should be noted that any sediment disposed of at Alcatraz has been permitted for that disposal by the Regional Board, BCDC, US EPA, and the Army Corps only after extensive chemical and biological testing and rigorous evaluation of those test results.

   Note also, however, that the report assumes that active sediment in general has lower PCB concentrations than older, buried sediment. Accepting this assumption for the moment, and assuming that there will always be some equilibrium volume of active sediment in the Bay, it would follow that keeping active, "cleaner" sediment in the Bay system would tend to reduce erosion of older, "dirtier"

sediment. Hence there could be an environmental advantage to dispose of dredged material at Alcatraz, as opposed to removing it from the system entirely.

3) The Port wishes to emphasize the need for future independent review of future PCB TMDL development documents by some sort of "blue-ribbon" panel of experts. Ideally this review would begin in the early stages of document preparation, so that the draft document released for public review has been demonstrated scientifically and technically defensible. Also, given the complexity of technical issues associated with TMDL development, a longer comment period for this and future documents is warranted.

4) Port staff is concerned to learn that nearly two thirds of the proposed PCB load reduction has been allocated to urban runoff. While this strategy may ultimately prove effective, the report does not provide adequate documentation for this decision. If local storm water management programs are expected to provide the lynchpin for implementation of the PCB TMDL, the findings supporting this policy should amount to more than three summarizing paragraphs in a technical report. The Port recommends a more detailed discussion of the studies cited in support of the urban runoff PCB allocation. Given the relevance of the cited urban runoff studies, Port staff also requests that those reports be posted on the Regional Board's TMDL website to provide reference during future phases of TMDL development.

The Port of San Francisco thanks you and your colleagues at the Regional Board for the opportunity to comment on the report. We look forward to continuing to work with the Regional Board on this issue.

Sincerely,

Jay A. Ach, R.G.
Manager of Environmental & Regulatory Affairs

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February 20, 2004

Via Electronic Mail

Fred Hetzel
San Francisco Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612
FH@rb2.swrcb.ca.gov

Re: January 8, 2004 TMDL Project Report on PCBs in San Francisco Bay

Dear Mr. Hetzel:

I am writing on behalf of San Francisco BayKeeper, a project of WaterKeepers Northern California ("BayKeeper"), to offer the following comments on the draft Total Maximum Daily Load ("TMDL") for PCBs in the San Francisco Bay ("PCBs TMDL"). BayKeeper appreciates the time and energy that Regional Board staff have put into this draft TMDL and implementation plan. The document consolidates results of years of PCBs monitoring, and goes a long way toward demystifying the difficult problem of PCBs contamination in the Bay. BayKeeper commends staff for many of the proposed solutions to the PCBs contamination problem.

To put today's comments in context, it is important to consider what the Clean Water Act requires of a TMDL. TMDLs are the Clean Water Act's last-ditch strategy for achieving water quality standards. They must be set at "levels necessary to meet applicable water quality standards . . . " 33 U.S.C. §1313(d). TMDLs take neither economic feasibility nor economic consequence into account. This "whatever it takes" principle is a departure from the State Implementation Plan's approach, and even from other parts of the Clean Water Act. For example, this section ignores the fine distinctions between secondary and advanced treatment for sewage treatment plants. It does not allow for a "maximum extent practicable" reduction in loads from municipal storm water dischargers. As the statute's backstop, 303(d) trumps other provisions.

Within this framework, the draft PCBs TMDL makes great strides toward regulating polluted storm water discharges. The draft identifies urban storm water as the second largest source of PCBs additions to the Bay, and does not shy away from mandating reductions in those contributions. Baykeeper applauds the TMDL's requirements for monitoring, documentation and reductions of PCBs discharges by municipal storm water dischargers.

In addition, with respect to PCBs, Baykeeper supports the use of both fish tissue and sediment measurements to determine compliance with the narrative standard for PCBs articulated in the Basin Plan.

However, as currently framed the PCBs TMDL raises serious legal and policy concerns. These include, but are not limited to, the PCBs TMDL's failure to:

- Consider the environmental justice implications of PCBs clean up;
- Bring the Bay into attainment in a reasonable timeframe;
- Eliminate or reduce loads to controllable sources until assimilative capacity is created;
- Exercise the Regional Board's full authority to regulate PCBs sources.

1. Environmental Justice Issues In PCBs Hot Spots and Affected Communities

The PCBs TMDL notes in passing that several PCBs "hot spots" have been identified around the Bay. These hot spots, such as Yosemite Slough in Hunters Point, are often located in areas that are already subject to extremes of environmental contamination, where current and historic industrial uses leave a toxic footprint. The demographics of Bay Area communities in these hot spots are predominantly racial minorities who are traditionally underrepresented in the administrative process.

In addition, individuals and communities that rely on Bay fish for subsistence are disproportionately affected by PCBs contamination, and are often the last to receive consumption warnings. Subsistence fishermen and their families, three quarters of whom are people of color with incomes under $45,000 per year according to a recent survey, consume these contaminated fish most often but receive the fewest warnings. Overall, Latino, Asian and African American communities are at greatest risk. An initial study by Save San Francisco Bay indicated that only about 7% of non-English speaking fishermen had ever received health warnings about Bay and Delta fish. Many fishermen reported eating 1 to 4 meals of local fish per week, despite the State of California's recommendation that no more than 2 meals of local fish be eaten per month.

PCBs clean up priorities must take into account the environmental injustice of the historic uses and current disparate health impacts in prioritizing clean up actions and weighing the cost of extending the TMDL's timeline.

2. CEQA Requires Application of the Precautionary Principle to This TMDL

The PCBs TMDL should take a precautionary approach. The Precautionary Principle provides that when an activity raises threats of harm to the environment, precautionary

measures should be taken even if some cause and effect relationships are not fully established. The proponent of the discharge should bear the burden of proof, not the general public. The Precautionary Principle is not outcome determinative, it merely requires analysis of less harmful options and explicit determination that a discharge's proponent has come forward with proof (and that the decision maker has considered the proof) that the activity should proceed.

CEQA, which mandates a precautionary process prior to agency action, applies to the Basin Plan amendment to incorporate the PCBs TMDL. In this case, the activities that raise a risk of harm are continued additions of PCBs to the Bay. The decision to provide for any ongoing discharges, the level at which those discharges will be permitted, and the risks of harm to the public at large as well as to specifically impacted populations, should be considered explicitly in the document. Even harms that are not scientifically certain must be considered. If 100 years is the precautionary timeframe for recovery, there should be an explicit link between the burden on the public and the cost to the dischargers of reducing their PCBs discharges.

The Precautionary Principle provides that scientific uncertainty should be resolved in favor of the public, not the discharger. This framework provides a strong economic incentive for a discharger to come forward with evidence that resolves the question. Most importantly, a precautionary approach makes explicit what is often an implicit policy decision about who bears the cost of pollution.

Since through this PCBs TMDL, the Regional Board is making decisions about will bear the cost of PCBs contamination, that decision making process should be clear and articulated. If discharges will continue, they must be clearly weighed against the interests of current Bay users, including the most heavily impacted communities.

3. The Implementation Timeline is Far Too Long

BayKeeper strongly opposes the 100 year recovery timeframe for the PCBs problem in San Francisco Bay. This is an unacceptable starting point for planning the Bay's recovery from past and ongoing PCBs degradation. Under the proposed schedule few people alive today will live to see this hypothetical recovery. The CWA does not contemplate such incredibly long implementation schedules. *See* 33 USC §1311. A 100 year recovery time frame makes a mockery of Act's articulated goal of creating fishable, swimmable, and navigable waters by 1983. 33 USC §1251(a). We believe more action must be taken now to speed the Bay's recovery.

The PCBs TMDL predicts that, if all external sources of PCBs to the Bay were set at 0, the active sediment layer would have only 25% of its current PCBs content in 40 years, a much more acceptable goal and a much more reasonable result.

4. All "Controllable" Sources Should be Given the Smallest Possible Load Allocations

Certain sources may be difficult to control and may absorb the waterway's assimilative capacity. As a result, the other "controllable" sources must share the remainder of the assimilative capacity if the goal of the TMDL is to be achieved. If the difficult to control sources absorb all of the assimilative capacity then the "controllable" sources should receive loads of zero until assimilative capacity becomes available.

Modelling on which the PCBs TMDL is based indicates that ". . . even small PCBs loads to the Bay will delay the reduction of in-Bay PCBs . . . " PCBs TMDL p. 50. Conversely, "[s]mall reductions of PCBs loads . . . are predicted to greatly accelerate the reduction of total PCBs in the Bay." Id. This suggests even more strongly that controllable sources such as wastewater and storm water should be allocated zero loads until assimilative capacity becomes available.

The PCBs TMDL does not allocate zero loads to any existing source. It does not even call for reductions in loading from wastewater dischargers, instead proposing that they maintain current PCBs discharge levels. Data in the report shows that advanced treatment for sewage can achieve significant reductions in PCBs discharges, but does not require all sewage treatment to meet that level of discharge. While Baykeeper applauds the load reductions required of storm water dischargers, the reality of the TMDL process requires more.

To assure an actual clean up of the Bay, the PCBs TMDL should make clear that effluent limits based on the TMDL cannot replace more stringent water quality-based effluent limits ("WQBELs") or performance based limits ("PBLs"). The CWA's requirements regarding WQBELs and PBLs are separate and distinct from the TMDL requirements. 33 USC §1312(a). A WQBEL is required where technology-based limits do not succeed in securing attainment of water quality standards. 33 USC §1311(b)(1)(c), 2(a). Under the proposed PCBs TMDL, San Francisco Bay will not attain water quality standards for PCBs until sometime around 2104. Under the Act, therefore, NPDES permits that allow PCBs discharges must contain WQBELs until then. In theory, a TMDL's WLAs should be more stringent than WQBELs and PBLs. However, if the PCBs TMDL were adopted as framed, dischargers might seek to evade the effect of low WQBELs or PBLs that have been calculated for NPDES permits by arguing that they have been displaced by the TMDL's loads. At a minimum, permits should contain the most stringent of an individual WLA, an existing WQBEL or a PBLs. The WLA process should not result in permitting rollbacks while assimilative capacity remains nonexistent.

5. The PCBs TMDL Must Assign Specific Loads and Load Reductions to Central Valley Sources, Not An Aggregate Load to the Central Valley

One major flaw in the proposed TMDL is the failure adequately to address Central Valley sources. The PCBs TMDL indicates that the Central Valley contributes approximately 42 kilograms per year of PCBs to the Bay. PCBs TMDL p. 34. A TMDL must allocate loads to all sources. 33 USC 1313(d), 40 CFR §130.2(h). A substantial portion of the PCBs from the Central Valley come from sources, such as urban storm water discharges and wastewater dischargers, which already have NPDES permits. This suggests a solid opportunity for reducing the Central Valley as a source. Given the dire state of affairs described in the PCBs TMDL, we cannot afford to pass up any chance to reduce PCBs. Further, we cannot rely on the assumption that the Central Valley Regional Board will comply with the Bay's load allocation.

The San Francisco Bay Regional Board has the authority and the duty under the Clean Water Act and its implementing regulation to allocate these loads and control these sources. The Act imposes a clear and unambiguous obligation on the State of California to allocate loads to all sources. 33 USC §1313(d)(1)(C), 40 CFR §130.2(g) and (h). As the state agency responsible for implementing the Bay's PCBs TMDL, the Regional Board derives its authority directly from section 303(d) of the CWA. Any state laws to the contrary are preempted by the federal statute. In the alternative, if the Board wanted to limit its jurisdiction to sources within Region Two, it could petition the State Board to accelerate development of the Central Valley component of the TMDL, and begin the analyses necessary to complete that portion of the TMDL in order to give the Central Valley Board a head start.

Until allocations to individual sources in the Central Valley are complete, the PCBs TMDL for the Bay remains incomplete, as both a legal and practical matter. The real possibility remains that the future regulatory process in the Central Valley will come to a different total load than the 32 kg/year provided for under this process. If this happens the TMDL equation for PCBs in the Bay will be ruined. If the Central Valley Water Board establishes a dramatically higher TMDL for the Delta all other loads in the Bay will require adjustment. Consequently, BayKeeper would not support amendments to the Bay's Basin Plan until this critical question is settled.

6. Allocations Must Be Made to Individual Sources, Not Broad Categories

The draft PCBs TMDL initially proposes individual waste load allocations for each wastewater discharger (PCBs TMDL p. 59) and then, in the implementation plan, proposes to implement a wastewater dischargers load "as a total mass load via a

watershed NPDES permit for all municipal dischargers." BayKeeper supports individual waste load allocations and strenuously opposes a categorical allocation approach, which is both illegal and ill-advised.

A maximum daily load must be "established at a level necessary to implement the applicable water quality standards … ." 33 U.S.C. §1313(d)(1)(C). EPA's implementing regulations require a TMDL to allocate specific loads to individual sources. 40 CFR §130.2 (g) and (h). Specifically, a waste load allocation is "the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution." (Emphasis added). 40 CFR §130.2(h). Similarly, a load allocation is "the portion of a receiving water's loading capacity that is attributed . . . to one of its existing or future nonpoint sources." (Emphasis added). 40 CFR §130.2(h). If it allocates loads to categories of sources rather than individual sources, the PCBs TMDL violates the Clean Water Act.

This unnecessary and confusing component of the TMDL should be eliminated.

For the forgoing reasons, BayKeeper urges the PCBs TMDL be amended to: (1) address environmental justice concerns implicated by PCBs hot spots and subsistence fishing; (2) include measures that will substantially shorten the time line for recovery; (3) allocate loads to Central Valley sources, and clarify that individual sources will receive individual loads; and (4) include assurances that effluent limitations will be consistent with WLAs, but not displace existing limitations that are more stringent. Thank you for your attention in this matter.

Sincerely,

Shana Lazerow
San Francisco Baykeeper Program Director
WaterKeepers Northern California

San Francisco Estuary Institute

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MEMORANDUM

March 5, 2004

To: Fred Hetzel, SFBRWQCB
From: Jay Davis, SFEI
Subject: Comments on PCB TMDL Project Report

GENERAL COMMENTS

Congratulations on finishing this significant piece of work. It is clear that a great deal of thought and preparation went into it. I think it is also a well-written document. My comments largely deal with providing updated information and more information.

There is a fundamental issue I am grappling with. The TMDL is focusing on the concentrations of PCBs on particles entering the Estuary. This is not really a mass loading approach, but a concentration-based approach. While it seems obvious that a supply of cleaner particles will be a good thing, we have to remember that the particles carry the PCBs in, but the PCBs don't necessarily stay on the particles for the entire 100 years or so that they reside in the active sediment layer. Is 20 kg of dilute input from the Valley of less concern than 20 kg of concentrated input from local tributaries? I am not sure of the answer to this one. The mass budget models currently treat them as being equivalent. The Valley load probably is of less concern, but how much less? If the Bay was actually depositional, it would be reasonable to expect that the clean sediment would bury the more contaminated sediment; but the Bay is eroding. This is a tough one. I'll keep thinking about it.

Section 4 should elaborate more on wildlife health concerns. Several studies on birds (clapper rails, cormorants, and terns) suggest possible impacts. Seal work also suggests concerns. I am sending you a bunch of references. This further elaboration will provide a good basis for the expanded food web modeling work.

Section 5

- Erosion of buried sediment should be treated as a loading pathway. I know there is not much that can realistically be done about it, but it probably is of a relatively significant magnitude and will affect recovery of the Bay. In discussing this source, an argument can be made in favor of clean particles entering the Bay to help prevent or minimize erosion.

- The case for controlling release from hot spots might be stronger if you could come up with an estimate of loads from this category. I know it would be crude, but that hasn't stopped us before! The recommendation that I think should come out of this would be to actually model and measure off-site transport from one of the major hotspots.

SPECIFIC COMMENTS

Page 7, para 4

Suggested wording:
Delta inflow from the Central Valley is the major source of new sediment input into the Bay. Most new sediment (approximately 60 percent) originates in the Sacramento-San Joaquin River drainage and enters primarily as suspended load during the high winter inflows (McKee et al., 2002; McKee et al., 2003).

McKee, L., Leatherbarrow, J., Pearce, S., and Davis, J., 2003. A review of urban runoff processes in the Bay Area: Existing knowledge, conceptual models, and monitoring recommendations. A report prepared for the Sources, Pathways and Loading Workgroup of the Regional Monitoring Program for Trace Substances. SFEI Contribution 66. San Francisco Estuary Institute, Oakland, Ca.

McKee, L., Ganju, N., Schoellhamer, D., Davis, J., Yee, D., Leatherbarrow, J., and Hoenicke, R., 2002. Estimates of suspended sediment flux entering San Francisco Bay from the Sacramento and San Joaquin Delta. SFEI contribution 65. San Francisco Estuary Institute, December 2002. 28pp.

The winter sediment load would initially settle in Suisun Bay also, I would think.

Page 7, para 5

Delete "the continual" – Suisun has been net erosional since the late 1800s and San Pablo net erosional since the 1950s

Page 7, para 6

Lester's work indicating decreased sediment supply from the Central Valley should be cited: McKee et al. 2002

Page 8, para 1

FYI: Schoellhamer is working on a new sediment budget
As mentioned above, Lester's work indicates less is coming in from the Valley in recent years

Page 9, para 1

You could also cite the food web model here, which is now final:

Gobas, F. and J. Wilcockson. 2003. San Francisco Bay PCB Food-Web Model. SFEI Contribution #90. San Francisco Estuary Institute, Oakland, CA.
Here is the link:
http://www.sfei.org/rmp/reports/pcb/pcbfoodweb_final.pdf

Page 9, para 2
Use the updated Gobas ref above

Page 19, para 3
Cormorant egg data also suggest PCBs are near the threshold for embryotoxic effects.

Here are a couple of references:
Davis, J.A., B.K. Greenfield, J. Ross, D. Crane, H. Spautz and N. Nur. 2003. Contaminant Accumulation in Eggs of Double-crested Cormorants and Song Sparrows in San Pablo Bay. San Francisco Estuary Institute, Oakland, CA.

Davis, J.A. 1997. Concentrations and Effects of Organochlorine Contaminants in Double-crested Cormorant Embryos from San Francisco Bay. Doctoral Dissertation, University of California, Davis, CA.

Seal studies have also suggested the possibility of effects:

Young, D, M. Becerra, D. Kopec, and S. Echols. 1998. GC-MS analysis of PCB congeners in blood of the harbor seal Phoca vitulina from San Francisco Bay. Chemosphere 37(4): 711-733.

And one that is in draft at the moment:
Neale, J. 2004. CONTAMINANT LOADS AND HEALTH CORRELATES IN HARBOR SEALS (PHOCA VITULINA) OF SAN FRANCISCO BAY, CALIFORNIA. Doctoral Dissertation, University of California, Davis, CA.

Yet to be published data on PCBs in terns also are a cause for concern, including and especially for the federally threatened least tern. Terry Adelsbach had a poster on this at the State of the Estuary. I'll email a copy to you.

Page 19, para 6
Davis (in press) has a more thorough and recent treatment of the bivalve trend data for PCBs

Davis, J.A. In press. The long term fate of PCBs in San Francisco Bay. Environmental Toxicology and Chemistry.

Page 20, Table 10
Provide units, indicate sum of congeners

Page 21, para 2
Use "screening value" instead of "screening level". This occurs repeatedly – I suggest a search and replace.

Page 21, equations
Earlier you state that the WQO is based on a one in a million risk. Is the screening value really based on a one in 100,000?

Page 25, para 1
You could point out that the water column exceedances are largely driven by suspended sediment concentrations. An important general concept that you don't state is the close linkage between the water and sediment compartments. There is so much settling and resuspension that these two compartments really act as one.

Page 27, para 5; Table 12 column 4
Not a big deal, but it would be better to report the central tendency of concentrations and the mass associated with that one value. We don't really think the individual sites are representative of the whole Bay.

Page 34, para 2
- Since there isn't net burial, the last sentence doesn't really apply. The cleaner sediment may help *dilute* the PCB problem.
- This relates to the fundamental issue I mentioned under General Comments.

Page 43, para 1
A RMP report on Contaminant Fate in Bay Sediment by Jon Leatherbarrow and Don Yee will address this topic in more depth (pun intended ;)). The report will be out for review in the next few weeks.

Page 45, para 1
Repeat of previous comment on burial by Central Valley particles. Dilution would be a better word.

Page 47, para 3
You go back and forth a bit between the 15 cm active layer with 1400 kg, to the 1 m layer with more PCBs, to my layer with 2500 kg, and this might confuse readers.

Page 50, para 1
If Connolly is right about diffusional flux out of the Bay (and I haven't done a critical analysis yet, but would guess that he probably has a point), then the load estimated from the model would be more in line with the loads estimated from empirical data (i.e., the load would have to be higher to balance the observed rate of decline). This 0 to 20 kg estimate is not my favorite conclusion from the modeling, given the uncertainty of the estimate and the lack of agreement with empirical data. The general properties of the recovery curves are more robust and important.

Page 52, para 1
Change first two sentences to:
Gobas and Wilcockson (2003) have completed a model based on field data from the Bay that relates PCBs concentrations in water and sediment to PCBs concentrations in sport fish.

Page 54, para 1

- I could run the model with a load of 31 kg/yr (or 30) if you want, and you could include this curve in figure 20.
- With 30 kg/yr the model predicts a mass of about 900 kg in 100 yr. We would need to get down to 10 kg/yr to hit the target in 100 yr. Connolly's point would speed things up, but I am not sure how much.

Page 56, para 6
Reduced loads from the Valley are a double-edged sword. If the load reduction is achieved by reduced sediment load, then erosion would be accelerated. Ideally, the Valley load reduction would be achieved by transport of cleaner particles, which would also keep erosion in check. I think there are a lot of clean particles in Hetch Hetchy….

SFPUC
WATER
HETCH HETCHY WATER & POWER
CLEAN WATER

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GENERAL MANAGER

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

February 20, 2004

California Regional Water Quality Control Board – San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
Attention: Fred Hetzel

Subject: PCB TMDL Project Report

Dear Dr. Hetzel:

The San Francisco Public Utilities Commission appreciates the opportunity to submit comments on the Draft Project Report for the Total Maximum Daily Load for PCBs in San Francisco Bay. We also appreciate the significant amount of work completed by the Board staff. The Report successfully consolidates the available information on PCBs in the Bay and presents a clear picture of TMDL issues. However, we have the following major concerns.

1. The Project Report does not establish a realistic conceptual approach for bringing the Bay into compliance with the PCB criteria. Although significant reductions in stormwater runoff are proposed (94%), the Report does not identify viable methods for attaining these removals. At the hearing, Board staff said that treatment was not expected and that stormwater agencies will not be asked to purchase (trade) reductions from other sources. If much of the runoff is from dispersed sources then the proposed approach will simply not work. It does not make sense to proceed with such a speculative implementation plan.

2. The sediment numeric target for the TMDL is set at 2.5 ug/Kg. "Ambient" sediment concentrations in the Bay is around 20 ug/Kg. During the Board presentation, Board staff said that sediment cleanup goals for hot spots would likely be around 200 ug/Kg. The Report should clearly specify this approach and the rationale.

3. The focus in in-Bay sediment hot spots is premature and unsubstantiated at this time. The Report identifies several hot spots, including several along the San Francisco shoreline. While these estuarine hot spots need to be evaluated and addressed, when appropriate, we believe that it is equally important to ensure that the Bay has been adequately surveyed to identify all the significant hot spots. We are concerned that the current set of estuarine hot spots consists of those sites where monitoring programs have been implemented or where dredging projects have been undertaken. In other words, the current hot spots are the incidental and unplanned result of other undertakings, not the result of a systematic identification of sediment problems in the Bay. Cleanups proceeding with the current limited information may not be addressing the more significant problems. In the absence of meaningful data, the modeling of bay source inputs will yield inaccurate results.

4. San Francisco has a combined sewer system (CSS) except for a few small areas. Because of the CSS, San Francisco provides treatment to stormwater runoff. The result of San Francisco's treatment of stormwater is that an estimated 60% of the solids in the

stormwater are removed from the waste stream (measured as total suspended solids). Since PCBs tend to adhere to particulate matter, stormwater treatment should provide major benefits by removing PCBs, which would otherwise be discharged to the Bay.

5. The Project Report does not propose reductions in the PCB loading from POTWs because this loading is minimal. Regardless, the Report does propose requiring significant pollution prevention efforts assigned to these dischargers. Since these are very minor sources placing this burden on them seems inappropriate and will detract from pollution prevention efforts needed for higher priority pollutants, which can be more effectively addressed by pollution prevention programs.

6. The data in the Report appears to indicate that POTWs may not be able to comply with WQBELs based on the CTR criteria. EPA's letter of 9/8/03 regarding the Mercury TMDL suggests that the TMDL must demonstrate compliance with water quality standards on a localized basis. Since dilution is not allowed for bioaccumulative substances, this seems to indicate a substantial compliance problem for POTWs. How does this TMDL implementation program address EPA's concerns?

We have also attached detailed comments. We thank you for allowing us this opportunity to comment on the draft Project Report. If you have any questions please do not hesitate to contact me at (415) 934-5787 or Arleen Navarret at (415) 242-2201.

Very truly yours,

Michael P. Carlin, Planning Bureau Manager

Attachment:

c.c. Patricia E. Martel, General Manager, SFPUC
William Keaney, Water Pollution Control Bureau Manager, SFPUC
Arleen Navarret, Senior Supervising Biologist, SFPUC
Gregg Olson, SFPUC

PCBs in San Francisco Bay - Total Maximum Daily Load Project Report
Dated January 8, 2004

Comments prepared by: Public Utilities Commission
Planning Bureau
City and County of San Francisco
1145 Market Street – Suite 401
San Francisco, CA 94103
Contact: Michael Carlin
Submitted to: California Regional Water Quality Control Board – San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
Attention: Fred Hetzel
E-mail: fh@rb2.swrcb.ca.gov

Date Submitted: February 20, 2004

General Comments

1. Please see the major comments presented in the cover letter.

2. Piecemeal development of TMDLs for a single waterbody has the potential to lead to inefficient implementation of corrective measures. EPA has advocated a watershed approach for TMDL development. Has the Board considered developing a single inclusive TMDL to address the pollutants which are primarily legacy pollutants: mercury, PCBs, chlordane, DDT, and dieldrin? Addressing these pollutants as a group could be less costly and more effective.

Detailed Comments

Comments to be addressed in the Project Report when it is finalized

1. Page 4, Paragraph 1 – (a) *Verification of the interim health advisory* – This section notes that SF Bay was initially placed on the list for PCBs due to an interim health advisory. This interim advisory was based on a 1994 pilot study by the San Francisco Bay Regional Board and others which identified pollutants of potential concern in fish tissue: PCBs, mercury, DDT, dieldrin, chlordane, and dioxins/furans. The report should discuss when the health advisory will be promulgated as a final advisory and how data collected in the last decade supports the initial risk assessment.

   (b) *Nation-wide PCB levels* - Are PCB levels in San Francisco Bay fish comparable to levels in other water bodies across the nation? In other words, are the levels within the national background level range for PCBs. This raises the issue of the appropriate use of TMDLs to address ubiquitous pollutants: would all US waterways require a TMDL based on the criteria used to list SF Bay? It may still be completely appropriate to proceed with this TMDL but it would be useful to put PCBs in SF Bay in context.

2. Page 7, Paragraph 6 - *Sediment erosion* – This section states that sediment erosion uncovers deposited PCBs and is potentially a significant sources of PCBs. Is the data on which this assumption is made statistically significant and is it based on assessment for representative sections of the Bay?

3. Page 9, Paragraph (none) – *Sea level rise* – The time period evaluated by the TMDL extends beyond 100 years. Will the predicted rise in sea level affect erosion and other factors considered in this TMDL? The conversion to tidal action of the salt ponds in the South Bay is expected to increase the tidal flux – will this affect erosion?

4. Page 9, Paragraph 4, sect 1.7 – *Needed studies* – This section notes the need for additional modeling and information of past deposition patterns as well as a food web model. How does the lack of these tools affect the TMDL evaluation. Will the proposed targets differ significantly depending on the range of the results produced by these new models and improved data.

5. Page 13, Paragraph 6 – *Losses from the environment* – This section notes the preferential loss of lower chlorinated PCBs from the environment. What does loss from the environment mean. Are these PCBs degraded into simpler compounds or are they volatilized and deposited elsewhere?

6. Page 19, Paragraph 6 – *Concentrations in benthic organisms over time* – This section and Table 10 describe the significant decrease in the concentration of PCBs in deployed bivalves between 1993 and 1997 (from 0% below the screening level to 78% below the screening level). Is this indicative the PCB problem is rapidly decreasing in significance even without the implementation of a TMDL.

7. Page 21, Paragraph 3 – *Screening level* – The screening level needs to be put in perspective. How does it compare with levels typically found in fish throughout the nation. Is the 22 ng/g wet weight a reasonable screening level given the levels typically detected in fish in the U.S. *Example*: Total PCBs: Mean 1,898 ppb; Median 209 ppb (from Table 1. Summary of PCBs Detected in Fish Tissues as Part of the National Study of Chemical Residues in Fish (1986-1989; EPA Fact Sheet: http://www.epa.gov/waterscience/fish/pcbs.pdf)

   Would the majority or perhaps all of the major US estuarine waterways fail to attain this screening level?

8. Page 22 – *Fish tissue levels over time* – Is there any data showing fish tissue PCB levels in SF Bay over time. Might these be indicative that PCBs are decreasing relatively rapidly now that PCBs have been phased out of most uses. A tracking study of fish in the Upper Mississippi River found significant decreases over time (e.g., median PCB concentrations in fillets of channel catfish decreased from nearly 5 ppm to less than 1 ppm between 1975-79 and 1995-98 - Figure 45, pg. 63, *Upper Mississippi River Water Quality Assessment Report*, March 2002, http://www.epa.gov/region5/water/umr_wq_assess.htm)

9. Page 23 –*PCB concentrations in fish tissues* – Figure 5 shows six charts with PCB concentrations in fish tissues at five locations (six locations in one chart).

   (a) Are these concentrations representative of the Bay as a whole? Is it possible to specify an "ambient" range for the Bay and what would this be.

(b) For context, what are typical concentrations in fish in the U.S. and in the Pacific?

(c) These graphs appear to show a significant decrease in most areas in fish tissue concentrations from 1997 to 2000, although this decrease is obscured by the change in scale on the vertical axis. (See, in particular, the data for Oakland.) Could the final report comment on the possible significance of this change? Is this data, together with the bivalve data, indicative of a trend towards improvement in fish tissue concentrations? (In the Final Report would it be possible to use a consistent scale to allow for easier comparison?)

(d) Is there any later data than that from 2000?

(e) Have the trends shown in the bivalve and fish tissue data been used to project future attainment of WQS?

10. Page 24 – *Aqueous PCBs concentrations*

(a) This section discusses the criterion of 170 pg/l and notes that SF Bay waters typically exceed this number. This discussion should provide a context and indicate what typical concentrations are in US waters, especially estuarine water and marine waters. Arctic concentrations appear to range from approximately the screening level to a level a magnitude greater - *Sources, Occurrence, Trends and Pathways in the Physical Environment - Canadian Arctic Contaminants Assessment Report II* at http://www.ainc-inac.gc.ca/NCP/pub/phytoc_e.html

(b) The Canadian report referenced above noted potential significant differences in results depending on whether ultraclean methods were used. Is this an issue for the data used in this TMDL report?

(c) This section notes that aqueous PCB concentrations are remaining more or less constant. If this is true, why are the concentrations in bivalve and fish tissue apparently decreasing? Please discuss in the final report.

11. Page 26 – *RMP sampling stations* – Figure 7 shows RMP water sampling stations but does not name them. Names would be useful to correlate with Table 11.

12. Page 28 – *Table 12* – This table apparently uses median concentrations from various sites to project a Bay-wide water column mass, however, it is not clear that this is the approach used.

13. Page 28 – *PCBs in sediment* – Is it realistic to project sediment PCBs for the entire Bay based on 2 cores taken from Richardson Bay?

14. Page 31 – *Hot spots* – Since the data used for hot spot identification was developed for a variety of other purposes (dredging for port areas, etc.) what evidence does the Board have that it is representative of hot spots on the Bay? In addition, previous sediment assessments were often based on a single sample from an area (Pilot Regional Monitoring Program). If hot spots are a major focus of this TMDL then a better Bay-wide assessment is critical.

15. Page 35 – *Runoff* – It would be useful to have a table with the data from the monitoring of conveyance system sediments. This section notes that "only in some cases" can the measured conveyance system hot spots be traced back to current or historical on-land activities. Does

this mean that the potential for cleaning up these on-land hot spots (and thereby reducing the runoff concentrations) is limited?

16. Page 42 – *Figure 15* – Please explain what this figure represents and what it means.

17. Page 47 – *Fish Tissue Target* – Focusing the TMDL on a fish tissue target is appropriate. However, is the goal of 22 ng/g realistic given general background concentrations of PCBs in the environment: fish tissues mean of 1,898 ppb from EPA's *National Study of Chemical Residues in Fish*? Are we setting an unattainable goal and attempting to make SF Bay fish two orders of magnitude cleaner than fish elsewhere? (Also, why are units of ng/g used for fish tissue but ug/kg used elsewhere?)

18. Page 50 – *Mass Budget Model* – The first paragraph discusses an 0 to 20 kg per year load. The second paragraph assumes a mass load of 80 kg/yr. Why the difference? In addition, is this model available or posted. The model should be available for public review.

19. Page 56 – *Urban runoff wasteload allocations* – Will the individual allocations be based on the 2.5 ug/kg target multiplied by the estimated sediment load or will it be based on some other basis for apportionment.

20. Page 56 – *Central Valley load allocations* – It seems inappropriate to lump together the PCB inputs from the Central Valley which come from existing waterway sediments and inputs from Central Valley urban areas. These should be two separate allocations.

21. Page 59 – *Implementation for POTW discharges* – The CTR criteria for PCBs is 0.00017 ug/L. Based on the data from Table 21, it appears that Bay area POTWs cannot comply with this criteria if applied end-of-pipe by water quality-based effluent limits (WQBELs) in the permits. EPA's letter of 9/8/03 regarding the Mercury TMDL stated that TMDLs must show compliance with standards on a localized basis (see their comment #1). Does this TMDL implementation program address EPA's concerns.

22. Page 60 – *Implementation for urban runoff* – Although a number of requirements are specified for POTWs (with no reductions required), relatively little detail explains what is expected of stormwater discharges other than on-land hot spot removal. The general approach is "adaptive management" which provides for "early implementation actions with a high probability of success." This raises two questions: (1) what are these early implementation actions with a high probability of success, and (2) is adaptive management appropriate when there is no evidence that early measures will provide the high level of success required (i.e., 94% removal of PCBs from runoff). For example, if expensive on-land hot spot removal result in only 50% PCB control, will dischargers have to built treatment facilities anyway to meet the TMDL target. If treatment facilities are ultimately necessary, then the adaptive management approach may lead to wasted effort and expense.

23. Page 62 – *Monitoring* – The monitoring program does not appear to include an effort to comprehensively assess Bay sediments to provide more assurance that significant sediment hot spots are identified and addressed.

From: "Dwinell, David L SPN" <David.L.Dwinell@spd02.usace.army.mil>
To: "Fred Hetzel (E-mail)" <fh@rb2.swrcb.ca.gov>
Date: 2/19/04 10:16AM
Subject: Comments on PCB TMDL

The following are some of the U.S. Army Corps of Engineers comments on the "PCBs in San Francisco Bay Total Maximum Daily Load Project Report:\

1. The mass balance used in the report is inadequate. It does not take into account major known losses and loads to the bay. Examples of major losses to the bay are sediment and water exiting the Gate. The mass balance does not address the erosion in San Pablo Bay and what the loads from this would be or how they would affect the loading. Between Richardson Bay and San Pablo Bay are 70,000 kg of PCBs the erosion of this material could prevent recovery if all other loads were eliminated.

2. The Corps does not agree that dredge material is a loading source to the Bay. In an appropriate mass balance, dredge material would not show up as a load, but as a redistribution of the material. Even with the Regional Water Quality Control Board's (RWQCB) "active layer" theory, this would not be a load if a true mass balance was done for PCBs.

3. The RWQCB's "active layer" prevents a true mass balance from being calculated since it requires moving the boundary of the mass balance of the bay to stay with the active layer if there is erosion of the bay or if there is accretion.

4. The report does not address what will be done to address the major unknowns. Without addressing the unknowns, it is not clear how the RWQCB will have any idea if the proposed solutions will work. There is a lot of science available on the items that the RWQCB has not address in this report.

5. The report does not provide the reader with sufficient information on the modeling effort to allow the reader to make a judgment whether this model is adequate to do the job. The inputs and the assumptions used in the modeling should be provided to the reader.

6. The report makes a number of critical statements and assumptions not backed up by science.

7. The report is not consistent with the proposed Mercury TMDL. This is the same Bay and the same sediment. The assumptions and methods should be consistent within both reports.

CC: "Snitz, Frank L SPN" <Frank.L.Snitz@spd02.usace.army.mil>, "Chang, Margaret SPN" <Margaret.Chang@spd02.usace.army.mil>, "Hedgecock, Neil C SPN" <Neil.C.Hedgecock@spd02.usace.army.mil>, "Sweatt, Shelah SPN" <Shelah.Sweatt@spd02.usace.army.mil>, "Davis, Clyde R SPN" <Clyde.R.Davis@spd02.usace.army.mil>

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Mr. Bruce Wolfe
Executive Officer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street
Oakland, CA 94612

Dear Mr. Wolfe:

Thank you for the opportunity to review and comment on the San Francisco Bay PCB total maximum daily load (TMDL) project report dated January 8, 2004. We reviewed the TMDLs and implementation provisions to determine whether they are consistent with applicable federal regulations concerning TMDLs and NPDES permitting. This letter provides summary comments; detailed comments and recommendations are provided in the enclosure.

We appreciate the Regional Board's hard work to develop the report. We fully recognize the complexity of PCB issues in the Bay and the difficulty of controlling sources of PCB loading to and within the Bay. The TMDL document reflects a significant amount of work and advances our understanding of how PCBs might operate in a large, complex aquatic system such as the Bay.

We are concerned that the draft TMDLs do not appear to meet all federal TMDL requirements. The implementation provisions addressing NPDES-permitted sources do not appear to be fully consistent with federal permitting requirements. It may be possible for the Regional Board to address some of these concerns by more clearly explaining the proposed decision and its analytical basis; however, some changes in the TMDLs and implementation provisions appear necessary to ensure full compliance with federal regulatory requirements, as discussed below.

Concerns About TMDL Provisions

Elements of the proposed TMDLs that do not appear to meet all federal regulatory requirements include:

1. **Compliance with Numeric Water Quality Standards**

The report does not demonstrate that the TMDLs would result in attainment of all applicable water quality standards. With respect to numeric standards, the TMDL report does not demonstrate how the numeric California Toxics Rule (CTR) human health criterion would be attained throughout the affected Bay segments. The CTR specifically provides that the standards are to be met throughout the receiving water unless mixing zones are allowed (which the State acknowledges is inappropriate for bioaccumulative toxic pollutants such as PCBs). PCB discharges appear to be causing or contributing to localized exceedances of water quality standards in the vicinity of the discharge locations and at other points in the Bay as well, as the Bay is clearly not in attainment with the water quality standards on a Bay-wide basis. This concern should be addressed by modifying the individual wasteload and load allocations to ensure attainment of the numeric water quality standards throughout the Bay.

2. **Compliance with Narrative Water Quality Standards**

With respect to narrative water quality standards, we support the proposed use of numeric targets in fish tissue and sediment, but are concerned that they may not be set at levels that fully protect the uses of concern, including human health and wildlife designated uses. The report appears to use a higher risk level of 10 (-5) than the CTR which uses a 10 (-6) risk level, and uses a less stringent cancer slope factor for PCBs than the CTR. These changes result in significantly less stringent numeric targets, which are not explained in the text. Additionally, no information is provided concerning the levels of protection necessary to protect wildlife. More discussion of this is needed, or if additional information is necessary, a brief discussion addressing information needs is warranted, to give direction for future studies. At a minimum, discussions with U.S. Fish and Wildlife and the California Department of Fish and Game concerning these issues should be summarized.

3. **Insufficient Margin of Safety**

The report discusses several sources of uncertainty in the TMDLs analysis but does not appear to provide a sufficient margin of safety to account for them, as required by 40 CFR 130.7(c)(1). For example, the report acknowledges that estimates of PCB loads from the Central Valley and in-bay sediment are subject to further data collection and modeling to verify or refine the current loading estimates, yet the TMDLs do not provide a margin of safety to account for these sources of uncertainty. Fish consumption estimates at the 95th percentile used to derive the fish tissue target are consistent with applicable EPA guidance; they are not implicitly conservative. Adaptive implementation may be helpful in adjusting the TMDLs as new information becomes available, but does not necessarily provide an implicit margin of safety for these TMDLs.

Concerns About Implementation Provisions

1. **Individual Water Quality Based Effluent Limitations**

We support the Regional Board's intention to include individual wasteload allocations for NPDES permitted dischargers (municipal and industrial, as well as storm water). However, we are concerned that the implementation plan includes only what appears to be a group water quality-based effluent limit (WQBEL) for municipal and industrial dischargers, respectively. Dischargers need to have individual WQBELs which are consistent with the individual WLAs.

2. **Assurance that Individual Discharges Will Not Cause Standards Exceedances**

We are concerned that if discharge limits in NPDES permits are set at the current discharge levels, this could result in discharges that exceed the applicable numeric water quality criteria. This would appear to be inconsistent with 40 CFR 122.44(d)(1), which requires that permit limitations be set at levels that do not result in exceedances of water quality standards.

In closing, we commend your staff for their hard work on this difficult TMDL proposal. We are committed to working with the State to identify TMDL and implementation approaches that address our shared goals of accomplishing reductions of PCB levels in the Bay as soon as possible, while ensuring that legal requirements are met. To this end, we would be happy to meet with you and your staff to explore alternatives for modifying the proposed TMDLs, allocations, and implementation provisions, in a way that is acceptable to all of us and is consistent with legal requirements. If you have any questions, please call me at (415) 972-3572 or refer staff to Diane Fleck at (415) 972-3480 concerning any comments.

Sincerely,

Alexis Strauss
Director
Water Division

9 March 2004

Enclosure

Enclosure:
Detailed Comments Concerning Proposed PCB TMDLs and Implementation Provisions for San Francisco Bay

I. TMDL Comments

1. Problem Statement: Coverage of the TMDLs

There appears to be some confusion as to whether San Leandro Bay is included in the TMDLs. We understand that San Leandro Bay is part of the Central Bay segment of San Francisco Bay. Since the Central Bay is included in the TMDLs, we assume that San Leandro Bay is therefore included in the TMDLs. This should be clarified.

The State's 2002 303(d) list includes listings for all of the segments of San Francisco Bay for both PCBs and dioxin-like PCBs. It is not clear in this document whether dioxin-like PCBs are included in the TMDLs. The Regional Board should clarify whether or not dioxin-like PCBs are included in the TMDLs, and if not, when the Board anticipates completion of the TMDLs for them. The specific PCB congeners that have the greatest affect on human health should be identified and discussed.

B. Section 2: PCBs: Quantitation

On page 15, the document states that the U.S. EPA in the CTR established the PCB water quality criterion based on the sum of Aroclors. This may be misleading. The CTR promulgated a saltwater chronic aquatic life criterion of 0.03 micrograms per liter (ug/l) with the footnote that this value reflects that "PCBs are a class of chemicals which include aroclors 1242, 1254, 1221, 1232, 1248, 1260, and 1016" and that the value applies to the sum of this set of seven aroclors. However, the CTR also promulgated a human health criterion for the Bay of 170 picogram per liters (pg/l) for total PCBs, with footnote v. Footnote v states "This criterion applies to total PCBs, e.g., the sum of all congener or isomer or homolog or aroclor analyses". This criterion is based on a carcinogenicity of 10 (-6) risk (i.e., one in one million). The TMDL document should reflect the fact that the CTR criterion for human health in the water column is 170 pg/l and applies to total PCBs defined very broadly as the sum of all congener or isomer or homolog or aroclor analyses.

On page 18, the document states that the CTR human health criterion was derived to protect against adverse effects due to PCBs in water. This may be misleading. The human health criterion applicable to the Bay is an "organism only" value, meaning that it is the water column concentration of PCBs to protect human health due to consumption of aquatic organisms that live in that water body.

C. Section 4: Impairment Assessment: Fish Tissue Studies

Equation 1 at page 21 is used to calculate a screening value for fish tissue in the Bay, and later in the document this value is used as the fish tissue numeric target for the TMDLs for PCBs

to meet water quality standards. The bases for this translation must be fully explained and shown to be consistent with current water quality standards. The project report indicates that the equation uses a 10 (-5) risk level. However, the legally applicable water quality standard for PCBs, found in the CTR, is calculated based on a 10 (-6) risk level, as is used throughout California for all other carcinogenic pollutants. This means that if the calculated fish tissue target for the TMDLs is in fact based on 10 (-5) risk, it will be 10 times less protective than the legally applicable (promulgated) CTR water column water quality criterion for PCBs. We are concerned that the target is not sufficiently stringent to protect the uses of concern, and that it may not result in attainment of the CTR water quality standard. The State needs to explain why the fish tissue target it selected is sufficiently stringent to protect the human health beneficial uses of concern. In making this analysis, we recommend that the State consider the rationale for using the 10 (-6) risk level discussed in the CTR preamble (65 FR 31699).

The cancer slope factor or q1* used in the equation at page 21 is defined as the "central estimate" or 1 mg/kg-day. However, EPA in the CTR used an upper bound potency factor reflecting high risk and persistence of 2 mg-kg/day. This is noteworthy because the value is used in the denominator of the calculation, making the final fish tissue value in this document twice the amount of what it would be if a cancer slope factor reflecting PCBs' high risk and persistence is used. EPA's discussion of the PCB cancer slope factor is at 65 FR 31698. The TMDL document should be consistent with the promulgated water quality criterion to reflect the currently applicable level of protection and to assure attainment of applicable water quality standards. We recommend that the Board consider using the cancer slope factor used in the CTR, or explain why the fish tissue target it selected using the lower cancer slope factor is sufficiently stringent to protect the human health beneficial uses of concern.

The document also states that the 22 ng/g should also be protective of the EST, RARE, and WILD beneficial uses since EPA has calculated a screening level of 160 ng/g for the protection of potential wildlife impacts from exposure to sediment contaminants (based on a 1997 document entitled "The Incidence and Severity of Sediment Contamination in Surface Waters of the United States"), However, it is not clear from the analysis presented in this TMDL document that this would be the appropriate number for San Francisco Bay. No information on wildlife is presented to show that 22 ng/g is protective of the rare or endangered wildlife species that reside in and around San Francisco Bay. An analysis is needed to support this statement.

D. Section 4: Impairment Assessment: Aqueous PCBs Concentrations

Table 11 at page 25 shows the water column concentrations of PCBs at various locations throughout the Bay, and in comparison with the CTR criterion (percent over CTR). It is clear that all locations listed in the table exceed the CTR water column criterion. However, the units of the water column values are missing. We assume it is in pg/l. It is also not apparent how the percent over the CTR value was derived, e.g., was the human health value of 170 pg/l used? The Table columns need units and its calculations need to be clarified.

E. Section 5: TMDL Development: Water Column Values

As noted above, Table 11 on page 25 lists water column PCB values for various locations in the Bay for the years 1993 through 2001. However, Table 12 on page 26 lists water column values for the years 1993 through 1998 and is then used to determine the mass of PCBs in the water column. Why were different ranges of years used, and why was the median value (and not the mean value) used to calculate the average total mass? These issues should be explained.

F. Section 5: TMDL Development: Sources and Loads: Municipal and Industrial Wastewater Discharges

At page 35, the document talks about the average PCB concentrations from POTWs with secondary treatment and with advanced treatment. The discussion refers the reader to Table 21 and 22. However, the tables are labeled differently: Concentrations in Wastewater from Deep Water Municipal Dischargers and Shallow Water Dischargers, respectively. If all secondary dischargers are deep water dischargers and all advanced treatment dischargers are shallow water dischargers, the Tables are correctly labeled, but this must be clarified. If this is not so, the titles of the Tables must be corrected.

In addition, it appears that only a few POTWs and refineries that discharge to the Bay were used to characterize wastewater, then used to estimate the total PCB loadings for all the POTWs and industrial dischargers (not just refineries), respectively. If the only information available was used to calculate these estimates, the document should clearly say so. If other information exists, it should have been used to further refine these estimates. For example, if discharge information about PCBs is available for other POTWs, it should be used to estimate the average PCB concentrations in the discharges. Similarly, if discharge information about PCBs is available for other dischargers in addition to refineries (chemical companies, C&H Sugar, US Navy, etc.), this information should be used to refine the industrial categorical estimates for PCB loads.

G. Section 5: TMDL Development: Sources and Loads: Runoff

In the discussion of runoff (urban and non-urban) at pages 35, and then on pages 40 and 41, it appears that PCB loads were derived from both water and sediment, although it is not clear. The discussion focuses on sediment loads. The discussion should be clarified as to whether water and sediment PCB loads were estimated or just sediment loads. If only sediment loads were estimated, the document should explain why water estimates were not included.

H. Section 5: TMDL Development: Movement of PCBs: Active Sediment Layer

In the discussion of the active sediment layer at pages 42 and 43, a mean sediment PCB concentration of 10 ug/kg is used to estimate the mass of PCBs in the active sediment layer. However, the 10 ug/kg value is not referenced, and does not appear in the earlier section discussing sediment concentrations in the Bay at pages 28 to 32. Table 14 at page 30 indicates that the average sediment concentrations in non-hot spot areas is between 22 ug/kg and 35 ug/kg, which is used as an upper bound estimate in the discussion at pages 42 and 43. In the discussion of runoff at page 35, in-bay ambient sediment values are referenced as in-between 20 and 35 ug/kg. The use of the 10 ug/kg estimate must be explained and referenced. Additionally, discussion of hot-spots, with sediment PCB concentrations ranging from 200 to 1,000,000 ug/kg (Table 15 at pages 31) is not included. Since hot spots were not included in your estimates of PCBs in the active sediment layer, this fact should be discussed and supported in the discussion at pages 42 and 43.

I. Section 6: Numeric Target: Water Column Target

At page 46, the document states that two numeric targets will be used: a fish tissue target and a sediment target to meet both human health and wildlife beneficial uses. EPA supports the use of multiple numeric targets in various media to ensure attainment of water quality standards. However, the TMDL document does not include as numeric targets, the current water quality standards which are expressed in water column concentration values. Since the TMDLs need to achieve all the applicable water quality standards, it is appropriate to include these numeric standards as TMDL targets because they directly express the applicable numeric water quality standards. Specifically, we recommend that the TMDL report include water column targets based on the human health criteria of 170 pg/l total PCBs from the CTR. The aquatic life chronic criterion from the CTR also applies to these waters, but since it is much less stringent, it will not control this analysis.

J. Section 6: Numeric Target: Fish Tissue and Sediment Targets

As discussed in our Comment C, the TMDL document proposes a fish tissue target of 22 ng/g based on a calculation using a 10 (-5) risk level and a different (smaller) cancer slope factor than was used to calculate the CTR's human health criterion of 170 pg/l of total PCBs in the water column; this results in a less protective final value. The TMDL document also proposes to use a sediment target of 2.5 ug/kg using a risk level of 10 (-5). The document asserts that if these final targets are reached, the State's beneficial uses relating to consumption of sport fish by humans will also be achieved, and that as such, it is consistent with the established numeric water quality criterion in the CTR for total PCBs. However, the sediment and fish tissue targets protect only to a 10 (-5) risk level, while the CTR criterion is intended to protect to a risk level of 10 (-6). As discussed in Comment C, we are concerned that these targets may not be protective of the beneficial uses, nor will they result in achievement of the CTR water column standard.

K. Section 7: Linkage Analysis

The discussion in the TMDL document at pages 48 to 52 discusses the Mass Budget Model and the Food Web Model. However, it is not clear whether and how these models were used to estimate that the assimilative capacity for the Bay, or to link loads with targets and associated attainment of water quality standards. This should be more clearly discussed.

L. Section 8: Total Maximum Daily Load

The TMDL document states at page 54 that the proposed TMDL is 31 kg/year, and that this necessitates a 53 kg/year reduction, since the total PCB load to the Bay is approximately 83 kg/year (Table 27). However, it is not clear why 31 kg/year was chosen. This must be clarified. The document states that with that load reduction, the one-box model predicts that we will reduce the PCBs in the active layer to about 350 kg in 100 years, and references Figure 20. However, Figure 20 shows that with a loading reduction to about 30 kg/year, the mass of PCBs in the Bay after 100 years will be about 950 kg (between the solid square, 20 kg/yr, and the open diamond, 40 kg/yr). It appears that if the loads were reduced to 10 kg/year, then the mass of PCBs in the Bay after 100 years would be about 350 kg, indicating a necessary reduction of about 75 kg/year. Based on Figure 20, it would appear that 10 kg/year would be a much more appropriate total TMDL value.

It is not clear why the SFEI one-box model discussed at page 50 calculates loads to the Bay over the last 20 years to have been between 0 and 20 kg annually, while the source analysis at page 54 says that currently about 83 kg/year of PCBs are added to the Bay. At page 50, the document notes that this discrepancy may be due to two factors: depth of the active layer and observed PCB concentration in mussel tissue over time. We recommend that the Board further explain this.

The TMDL document at page 54 also discusses a current load from the Central Valley of 42 kg/year, and a proposed load of 32 kg/year. However, at page 61 the document states that "... at this time, we do not expect PCB load reductions from Central Valley input." We recommend that the Board clarify this discussion and include how it plans to reduce input from the Central Valley and over what period of time

The TMDL document at page 54 in Table 27 lists "Atmosphere" as a source of PCBs with a current and proposed load of (-7). This includes PCB deposition from air sources as well as volatilization of PCBs from the water surface. Although deposition from air sources is a source of PCBs in the Bay, volatilization is not a source. We recommend that the Regional Board set an allocation for deposition only. PCB losses from volatilization from the water surface would be more appropriately included and accounted for in the model used for the linkage analysis.

Lastly, at the beginning of this section on TMDLs, definitions are provided for Wasteload Allocations, Load Allocations and Margin of Safety. We recommend that the Board attribute the Load and Wasteload Allocations definitions to the EPA regulations at 40 CFR part

130.2 Definitions, dated Jan 11, 1985 as amended on April 11, 1989. They are verbatim from that regulation. We recommend that the Board use the language at 40 CFR part 130.32(b)(8) in describing a Margin of Safety.

M. Section 8: Total Maximum Daily Load

EPA agrees that loads do not need to be expressed as daily loads if there are technical reasons why another time period is more appropriate. However, little explanation is given in the TMDL document as to why the loads were not calculated as daily loads, other than at page 53 where it states that a longer period of time may be necessary when considering sediment-bound contaminants. The Board should include a more detailed explanation as to why daily loads are inappropriate or cannot be calculated, and why an alternative approach is more appropriate.

N. Section 8: Total Maximum Daily Load: Waste Load Allocations

The TMDL document at page 55 states that individual wasteload allocations will be specified for each municipal and industrial wastewater discharger, and that individual load allocations will be based on each facility's fraction of the total yearly wastewater discharged from the source category. However in Section 9, Implementation, the document states that the Board plans to implement these WLAs as a total mass load via a watershed permit for all municipal dischargers (using two categories: secondary treatment facilities and advanced treatment facilities). This is a cause for concern, because point source dischargers need to have individual WQBELs which are consistent with the individual WLAs.

Additionally, it does not appear that holding municipalities and industrial dischargers at current performance will result in meeting all water quality standards for PCBs. Table 11 at page 25 clearly shows that water quality throughout the Bay is not meeting the CTR water quality standard for the protection of human health. Indeed, none of the locations even come close to meeting the standard, and many are orders of magnitude over the standard. The discussion at page 35 indicates that average PCB concentrations from secondary municipal facilities (3,600 pg/l), advanced municipal facilities (210 pg/l), and refineries (270 pg/l) are all over the CTR standard of 170 pg/l. It is not clear how allowing dischargers to maintain their current discharges (especially the secondary municipal facilities) could result in attainment of water quality standards.

O. Section 8: Total Maximum Daily Load: Urban Runoff

On page 56, the document discusses wasteload allocations for permitted municipal urban storm water runoff and for the group, allocates 2 kg/year, based on the sediment target of 2.5 ug/kg. However, it states that specific wasteload allocations and proposed time frames for implementation will be developed via an adaptive implementation strategy. We understand this to mean sometime in the future. We recommend that the Board develop and discuss in the final TMDL document, the methodology for developing individual wasteload allocations and the proposed time frames for implementation.

P. Section 8: Total Maximum Daily Load: Margin of Safety

The report at page 57 and 58, discusses two ways in which an implicit margin of safety has been incorporated into the TMDL: a conservative fish tissue target (using the 95th percent consumption rate rather than the median consumption rate[1]); and promoting an adaptive approach in setting and evaluating the effectiveness of the proposed load and wasteload allocations. We believe this discussion needs more support. First, the fish tissue target may not be conservative since it appears to use a risk level 10 times less protective than the current human health water quality standard, as discussed in Comment C, above. In addition, EPA, in its revised human health methodology for water quality criteria[2], recommends and uses the 90th percentile in estimating the revised national fish consumption values used in criteria guidance (17.5 g/day is the 90th percentile consumption rate for the general population [consumers and non-consumers of fish] in the U.S.) Secondly, it is not clear how promoting an adaptive management approach is conservative and would lead to an implicit margin of safety.

II. Implementation Plan Comments

A. Section 9: Implementation: Load and Wasteload Allocations

The implementation section at page 59 states that the Board expects that the current level

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[1] The Board cites EPA's document entitled "Bioaccumulation Testing and Interpretation for The Purpose of Sediment Quality Assessment, Status and Needs" EPA-823-R-00-001, dated February, 2000,. However, this document is not intended to serve as guidance (see disclaimer on page i).

[2] U.S. Environmental Protection Agency. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000). Office of Water, Washington, D.C. EPA-822-B-00-004. This document recommends that States use local fish consumption data, at the 90th or 95th percentile values or averages of an identified population that it plans to protect, e.g., subsistence fishermen). EPA generally recommends that mean values be the lowest value considered by states and tribes when choosing intake rates (page 4-26) for criteria development.

of performance for each category of municipal discharger (secondary and advanced) as well as for industrial dischargers will be maintained. The TMDL document at page 35 states that the current level of performance for secondary municipal dischargers is on average 3,600 pg/l, for advanced municipal dischargers, 210 pg/l, and for industrial dischargers (based on petroleum refineries), 270 pg/l. However, the CTR human health water quality criterion is 170 pg/l.

NPDES regulations say that NPDES permits must contain water quality-based effluent limitations or WQBELs for any pollutant that has the potential to cause or contribute to a water quality exceedence (40 CFR 122.44(d)(1)(i)). San Francisco Bay is not in attainment of its PCB water quality standards and is not expected to attain standards for at least 100 years (based on the calculations in the TMDL document). Discharges of PCBs to the Bay have the potential to cause or contribute to a water quality exceedence for PCBs. Therefore, point source discharges of PCBs to the Bay regulated through NPDES permits must have WQBELs. The implementation plan does not appear to contemplate WQBELs for NPDES dischargers that are consistent with achieving current water quality standards contained in the CTR.

Additionally, WQBELs need to be consistent with WLAs in a TMDL (40 CFR 122.44(d)(1)(viii)(B)). Municipal and industrial dischargers need to have individual WQBELs which are consistent with individual WLAs in the TMDLs.

We are pleased to see that municipal and industrial permitees will be required to implement PCB monitoring and source control programs, as well as evaluate the potential for developing a mass offset program and bioavailability studies. We believe that effective source control identification and implementation might prove extremely useful toward achievement of current discharges that are consistent with all applicable water quality standards.

Western States Petroleum Association
Credible Solutions • Responsive Service • Since 1907

Kevin Buchan
Environmental Coordinator

February 20, 2004

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SUBMITTED VIA EMAIL: fh@rb2.swrcb.ca.gov

RE: WSPA Comments on the Total Maximum Daily Load Project Report, "PCBs in San Francisco Bay", dated January 8, 2004

Mr. Hetzel,

The Western States Petroleum Association (WSPA) is a non-profit trade association representing a full spectrum of companies which explore for, produce, refine, transport, and market petroleum products in the six western states. WSPA appreciates the opportunity to provide comments on this Report.

We believe efforts should be continued by RWQCB staff to ensure the PCB TMDL is consistent with the Mercury TMDL report. Areas such as air deposition, flushing of sediment out the Golden Gate, and others should be reflected in this Report as was done in the Mercury TMDL Report.

WSPA endorses the comments being submitted by the Bay Planning Coalition, and incorporates their comments by reference.

Lastly, we look forward to continuing the collaborative work with the RWQCB to complete the TMDLs listed for San Francisco Bay. We believe the process has shown itself to be successful, being based on sound science and realistic strategies, for moving the waterbody toward attainment with Basin Plan objectives.

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